Module-I

HR analytics

HR analytics involves using data to make informed decisions about HR practices and improve organizational performance. Its benefits include improved talent acquisition, enhanced employee engagement, better workforce planning, and increased cost savings. However, challenges include data integration, ensuring data accuracy, and overcoming resistance to change.

What is HR analytics?

HR analytics involves collecting data and key metrics on your workforce and organization to gain valuable insights and better understand their effectiveness. With this data, you can spot weaknesses across the business and improve these to boost efficiency, productivity, retention rates, training effectiveness, and more—all of which will benefit your bottom line.

HR analytics benefits

1. Practicing evidence-based HR

Traditionally, HR management was always based on trends, biases, or temporary fixes. There will generally be inconsistencies between what HR professionals believe to be suitable and effective and what data proves to be effective. Evidence-based HR centers on making decisions supported by evidence from internal data, research findings and studies, expert judgment, real-life experience, values, and concerns. This approach enables HR professionals to base HR decisions on facts and evidence rather than relying solely on a gut feeling.

One example of this is when PNC bank's HR team used HR analytics to better understand the risk of their incentive plans. This helped them better understand the nature of certain roles. Then, they created a framework to mitigate that risk rather than scrapping their bonus policies altogether.

Another example is when Kraft Heinz launched a hostile takeover bid of Unilever in 2017. Unilever's HR team used analytics tools to analyze networks in the organization and create models for potential cost reductions. They were also able to track employees' moods and attitudes and gauge how employees were reacting to Unilever's defense strategy. That helped them make key decisions during this time of crisis. Ultimately, they were able to show they were in a better position than Kraft Heinz to leverage the strengths of their business.

Enrolling in a People Analytics Certificate Program will equip you with skills, knowledge, and hands-on experience to start capitalizing on the benefits of HR analytics at your organization.

2. Improving recruitment and talent acquisition

You gain valuable insights into your hiring process by tracking data pertaining to key recruitment metrics such as cost per hire, application completion rates, quality of hire, quality of source, and candidate experience. This allows you to see what's working, what needs improvement, and make changes accordingly, which will positively impact the business.

One of the biggest problems organizations face is finding the right people to fit the right roles. What's more, early attrition rates can cost a business significant amounts of money. A staggering 66% of CFOs have confessed they have poor cultural fit decisions when hiring for their organization. Therefore, it's vital to know who to hire to ensure optimum performance and productivity in your business and reduce your turnover rates and recruitment spending.

HR analytics can sift through all the information and skills in new candidates' applications, compare this with the skills and behaviours of your current top performers, and make a shortlist of the best potential candidates using algorithms. For example, tailored situational judgement assessments can ensure candidates have the right competencies to thrive in a specific role. This saves your recruiters time and your business money and increases your chances of making the right hire the first time around.

Rolls-Royce enlisted the help of Aon to reduce their drop-out rate by implementing a shorter and more engaging assessment that identified the candidates with the most talent and potential. As a result, 98% of applicants that registered for online tests completed all of them.

3. Managing employee performance and productivity

With HR analytics and key performance indicators (KPIs), you can assess the ROI of all employees. It helps you identify your top performers (and use these as a benchmark when making new hires) and those who are

struggling (and offer them support). A better understanding of motivation, productivity, and efficiency can help all employees improve their performance and contribute to the bottom line.

Analytics can offer insight into interactions between employees and collaboration between departments. It can also show you how employees interact with certain applications and how this affects their productivity. Through this, you can optimize internal processes and streamline employees' workflows to boost performance, collaboration, and productivity. For example, if an organization can analyze the productivity levels of its remote workers, then it can use these findings to shape its remote working policies accordingly.

Best Buy found that a 0.1% increase in engagement results in over $100,000 in annual operating income per store. This finding led Best Buy to increase the regularity of their employee engagement surveys from annually to quarterly.

4. Helping build equitable compensation and benefits packages

Analyzing compensation data allows you to spot any pay disparities and fix them to ensure you're achieving internal and external pay equity. It can also help you determine which benefits are most valued by your employees. Then, you can adjust your compensation and benefits packages accordingly. Plus, you can decide if an additional bonus percentage leads to improved retention or performance or whether it makes no noticeable difference. That can ultimately save you money.

An article by Employee Benefit News shows how employees at Staples.com feel about their compensation packages. 62.3% of them stated they would accept a lower salary in exchange for better perks at work. In addition, the survey found that the list of must-have benefits and benefits that would convince an employee not to leave the company been almost identical. They included flexible hours, remote work options, and paid insurance premiums all in high demand. Insights such as this can help you tailor your offering to boost morale and retention.

5. Enabling effective workforce planning

HR analytics also enables companies to remain ahead of the game by forecasting and preparing for future workforce demands. For example, predicting attrition rates helps organizations improve their workforce planning, particularly for critical roles within the business.

IBM used data on recruitment, tenure, performance, role, salary, promotion history, and location to reduce their turnover rates in critical roles by 25% over four years.

Analytics can also help measure over- or understaffing. For example, a Zimbabwean mining company found that a 22.5% increase in activity calls is required to justify each additional hire to maintain workloads and avoid burnout.

6. Easily conducting skills gap analyses

The richness and depth of HR analytics software mean it can use algorithms to identify skills and knowledge gaps within your current teams. Your team's existing skills can be plotted on a grid against the skills you need. That can help you identify weak spots and propose a plan to bridge these. Gaps like these often harm employee engagement, morale, and turnover rates if left unresolved.

You can analyze current skill sets, performance, education, and experience to identify which of your employees are most suited to upskill in a specific area. This means that HR doesn't need to recruit new talent instantly. Instead, they can look internally to fill talent and skills gaps before looking elsewhere. Overall, this reduces recruitment costs by utilizing the potential of your current workforce, improves turnover rates, and can build a stronger culture.

7. Boosting learning and development, upskilling and reskilling

Data can show you where your employees need up skilling or deskilling, if they're utilizing training opportunities, and if the training is relevant for them. This helps you create relevant learning and development programs that help up skill and deskill your employees, boost performance, achieve organizational goals, and save time and money.

For example, analytics can help you understand which of your employees prefer on-the-job learning and which prefer classroom learning. It can also show you which employees are more likely to seek additional learning and what character traits they possess.

Fujitsu used HR analytics to determine whether their peer coaching program was effective and should be continued. They found a strong correlation between peer coaching and business results and continued the program.

A large Dutch FMCG retailer used people analytics to analyze the effectiveness of training. They found that training shop personnel positively impacted the shop's financial performance, which they measured through A/B testing. The ROI of their training program was 400% in the first year.

8. Preventing turnover

Another of the benefits of HR analytics is that they can help you understand:

- which employees are leaving and why,
- your retention rate,
- which departments have a higher than average turnover,
- early attrition rates for new hires,
- and which employees are most likely to leave in the future.

This data enables organizations to prevent losses before they happen, reduce their turnover rate by understanding the root cause, and then design targeted strategies to improve retention.

Shoe retailer Clarks used analytics to determine a clear link between employee engagement and the subsequent impact on individual and company performance. They found that a 1% improvement in engagement led to a 0.4% increase in business performance. The length of tenure of a store manager also turned out to be a strong indicator of performance. With this data, Clarks created a template for high-performing stores and a toolkit on engagement for managers to help boost the performance of their employees and store.

Similarly, at Credit Suisse, analytics enabled the HR team to predict who might quit their job and why. Managers received this information to reduce the risk of turnover and improve retention. They were also provided training to help retain high-performing employees who might be at risk of leaving. Overall, this program saved the company approximately $70,000,000 a year.

9. Improving candidate and employee experience

A study found that 56% of applicants encounter some form of a technical issue during the job application process. These can lead to abandoned applications and missing out on top talent. Providing an engaging and flawless recruitment and on boarding process where candidates have a positive experience leads to improved retention, a boost to your employer brand, and future talent acquisition.

HR analytics can help you analyze the candidate experience during the recruitment process and your employees' experience at work day-to-day. For example, how strong their sense of belonging is, where they perform best, how they feel about every aspect of their job, and how they can continue to grow in their role and the organization. This information can help you improve the daily experience of your employees and create a better working environment and company culture.

For example, at E.ON, people analytics helped the company discover that their higher than average employee absence rate was increased by a lack of a long holiday at some point during the year or not taking a day or two off every so often during the year. These findings were communicated to managers to improve holiday approval policies. Ultimately, it led to a more positive employee experience and reduced absenteeism rate.

10. Identifying inefficiencies

HR analytics will help HR professionals look outward into business processes and operations, but also internally to shine a spotlight on areas that can be improved within HR itself. For example, systems that don't communicate well, a reliance on manual paper-processes where digital software could save time and money.

Through data, HR can identify processes that aren't helping the business achieve desired results or are inefficient and redesign these. More efficient HR processes can lead to a significant boost in the overall vitality of an organization.

11. Saving money

Analytics can help an organization use its budget more effectively by demonstrating the potential value of each dollar spent. Software can unite HR and finance departments and offer one single source of truth, enabling both teams to have a strong understanding of metrics, including ROI numbers and salaries.

For example, suppose data shows you that one of your L&D programs is helping employees perform better and boosting your bottom line. In that case, it makes sense to invest in this program and cut spending on any programs that aren't delivering the same value. Similarly, if one particular source continually brings you top-performing candidates, it makes sense to allocate the majority of your recruitment budget on that channel rather than ones bringing in mediocre candidates.

12. Supporting internal mobility

Data on your employees' skills help an organization utilize its talent in the most effective way. Plus, allowing employees to have different experiences, gain new skills, and advance in their career within the company can contribute to their short and long-term goals. It will also help save time and money on external hires, improve diversity and innovation, and lead to better retention rates. All of this positively impacts your bottom line.

LinkedIn's Global Talent Trends report shows that employees are likely to stay 41% longer in an organization that regularly hires from within. Gartner reports that employees are 27% more likely to put in more effort at work in an organization with greater internal mobility.

Furthermore, AI solutions can help you map out internal career paths for employees. For example, if an employee wants to take the next step in their career but is unsure what to do, AI can make a recommendation based on the data it has. This helps employers and employees make more informed decisions together and reduce attrition rates.

13. Preventing workplace misconduct

Another significant benefit of HR analytics software is the data it collects from incident reports. This information can help identify trends in misconduct such as workplace harassment and bias. The data enables organizations to make tactical plans to anticipate and combat these issues and improve workplace conduct across the business.

In response to the sexual harassment scandal at Fox News, the company has since created the "Fox News Workplace Professionalism and Inclusion Council". It consists of two HR executives and four independent members who will use data from employee surveys to provide reports to company directors and publish findings on its website.

14. Improving workplace safety

Workplace safety is a priority for all organizations. A safe workplace means fewer injuries at work for employees and also saves the company money in injury-related costs and compensation. In the US alone, work injury costs exceed more than $170 billion each year. In fact, most of these incidents are preventable. Using your safety incidents data, you can prevent future workplace injuries and create a safer work environment for all your employees in the process.

At Shell, analytics found that employee engagement was linked to better business performance through improved safety practices. A 1% increase in employee engagement resulted in a 4% drop of 'recordable case frequency'. Also, safety performance was directly related to business performance.

You can also check out our tutorial on how to use Association Rules to analyze safety data and prevent future safety incidents.

15. Uncovering trends

The majority of HR analytics platforms today utilize machine learning to spot patterns that the human eye easily misses. Such a platform can also help produce reports on areas and issues that may otherwise go overlooked. Patterns related to behavior, performance, commute times and recruitment source quality can all be observed and reflected on.

An example of uncovering trends is when Cisco used demographic data to decide the best location to open new offices. They combined data on current usage rates of office space, cost and availability of talent, and availability of graduates from universities. The analysis enabled them to open offices in locations where fewer large players were competing for the same talent.

16. Supporting your DEIB goals

A report published by McKinsey & Company found that ethnically diverse companies were 36% more likely to outperform competitors. Meanwhile, research by Harvard Business Review has found that organizations with greater cultural diversity have higher market valuations and produce higher quality intellectual property.

HR analytics allows organizations to track diversity on all levels of the company—from entry-level to management all the way through to leadership teams. You can also track how candidates pass through your selection process to ensure you're increasing the diversity of your workforce and track the progress you're making along the way.

Analytics can help organizations map out their current organizational culture. They compare it with their ideal company culture, gain insight into where the gaps are, and then take conscious steps towards bridging these.

17. Allowing organizations to be proactive

Through continual insights, feedback, and analysis of results, organizations can be proactive in their approach rather than reactive. It helps them stay ahead and anticipate and prevent future problems.

Comparing past and present data enables organizations to make logical predictions, foresee the future needs of the business, and prepare accordingly. That way, business can implement scenario-based planning and prepare for multiple futures.

18. Adding value to the business

As you can see, HR analytics not only enables you improve HR but also helps you improve the business's overall operations through hiring, training, and retaining your top performers. Analytics can help you maintain an accurate record of progress, compare this over time, and observe any fundamental changes.

Data also helps HR gain a seat at the table by aligning hard facts with business goals and objectives. HR practitioners can demonstrate to leadership teams how proposed strategies will help the business thrive and lead to higher revenue. Business decisions that involve structural change or organizational development always benefit greatly from solid HR advisory. Therefore, HR analytics offers HR teams a golden opportunity to become true business partners by educating business leaders and designing and implementing new strategies and processes that help drive the company forward.

Challenges of HR Analytics

In the process of heading towards the post-pandemic era, it is great to see that People Analytics events are being held live at venues across the globe again. As it is very interesting to see how we come out of the crisis in general, I am also curious to see how People Analytics has evolved over the last two years. I think the subject has benefited from the crisis because the focus on people during the pandemic increased. What I hope to see is that we have grown when it comes to People Analytics maturity.
The bigger part of the People Analytics events is focusing on companies that still have to start with People Analytics or those who have just started. The frontrunners on the matter are the ones giving the presentations and sharing their knowledge, but if you are a frontrunner, there is not much new to learn from others. In this article, I would like to share some (personal) experiences on the challenges for organizations where People Analytics is already a bit more advanced than just getting started.
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1. Employee experience

During the crisis, the employee experience has been more critical than ever. Faced with the lockdowns around the globe, working from home became the 'new normal'. The physical barrier between the office and home changed overnight. The effect of that change has had a significant impact on employees.
Knowing how your employees are doing has become essential. Now that we are going back to the office, hybrid working comes into play. What will the effect be? To find that out, more and more organizations are taking employee experience surveys more seriously.

In the coming years, the development of reliable surveys and translating outcomes into actions will be a very important task for the People Analytics departments. And organizations will also send out these surveys more frequently than before. I believe organizations that take this seriously will implement a continuous listening program to make sure they get a better understanding of how their employees are working and how they feel.
This will have a positive impact on employee (mental) health. It will also give your People Analytics department the chance to connect the outcomes to other subjects with business value, like absenteeism and retention.

2. Reskilling and upskilling
The crisis has seen winners like supermarkets and delivery services. But there are also quite some losers that are struggling because of the pandemic. This has given a boost to the future of work change we were already going to face.
A lot of organizations are in the middle of a transformation to get their companies healthy again. In most cases, the main organizational objective is to increase value and productivity. This is where employee skill development is key.
Last year has been pretty intense when it comes to computer skills, for instance, because of remote working. But the future of work has already put us to the difficult transformation of future-proofing jobs.
A big challenge for People Analytics regarding skills is data. I have not seen a lot of companies yet that have their skills data at a functional level of quality. Yes, they might have the data on the training they have provided in the last couple of years. But there are not a lot of companies that have data on the level of education someone has.
I work for a 20,000-employee company, but I cannot tell how many of my colleagues went to university. And that is just the basics! Getting that data in a useful way will be top of the list of many companies in the years ahead. We could start by having our skills inventory up to date. More and more HR systems will allow you to search within that skills inventory. One of the biggest People Analytics challenges here is keeping the data up to date since your workforce will also continue to evolve and learn new skills.

3. Business impact
Another challenge for the more advanced People Analytics departments is getting a more sustainable impact on the company's strategy. A lot of these departments work on PA projects. Achieving great outcomes, within most cases, requires good interventions to drive change. But the next step should be that People Analytics gets a role in determining what fact-based KPIs help the company improve and show that the company is doing what it's supposed to do.
This also implies that HR needs a more prominent role in the company. Should you be able to get to that point, you actually have a considerable business impact. Getting to that point is surely among the key People Analytics challenges in 2022 and beyond.
4. Making People Analytics about business, not HR
Speaking of business value, the next step for People Analytics is to change from being about HR to being about the business. What I mean by that is that people are important assets that, in most cases, directly impact business outcomes. It is a business interest that these people are good at their job and work safely and in good health.
Looking at People Analytics as a business challenge is hard, especially when you are just getting started. However, even the more advanced organizations are struggling with the same thing. If you feel more advanced already, your analysis reports should be finding their way to the board room by now. That is where your impact should be focusing on the next few years: helping your decision-makers make better decisions.
5. Skills-based approach to building teams
People come to organizations with diverse skills and experiences. Understanding what combination of skills that people have results in high-performance teams in any specific department means you found the key to success. We can assume that the perfect mix of people and skills within a marketing department would be different than the mix needed for a team of engineers.
If we can really understand how these mixes work, imagine how we could help recruitment to source and select the right people and how we could help business managers in developing their teams, and increase business value.
The People Analytics teams should also be able to link research on personality types to broader issues like retention, team productivity, or absenteeism. That way, they can truly help business managers to better understand the right mix within their teams.
6. Data translation and self-service
People Analytics departments cannot do their job on their own. They need their HR colleagues to spread the word. People Analytics departments should be focusing on investing in a fact-based culture. HR wants to be considered as a serious business partner. To achieve this, we need to combine expert knowledge with information based on facts. And only by doing so can we make a difference and keep our seat at the table.
There is something else the People Analytics department should work on. Suppose that your fact-based campaign works out great, and more and more colleagues will use data in their work. That means that data, or better yet, information, should be available. You should be able to offer self-service information access for your colleagues in both HR and business. The basics would be dashboards, but you should also think about how you can make the outcomes of other analyses widely available as well.

Doing this successfully remains one of the major People Analytics challenges.

7. People Analytics team development

Finally, the People Analytics teams will change as well. More than ever, the People Analytics teams should be translators of data and outcomes into business language. Storytelling is a skill more difficult to find than R and Python skills. For that reason, we need to work on our storytelling.

I hope to work together more with colleagues within the company who are already more advanced in storytelling, such as Recruitment or Marketing. They are experienced in 'selling' the company to new co-workers and clients. The before mentioned continuous listening implies that People Analytics should know more about surveys than they do now, so that's another point of learning they can focus on in 2022 and beyond.

Types of HR Analytics

Descriptive Analytics

Descriptive analytics is the most basic type of HR analytics. It involves collecting and analyzing data to gain insights into past events and trends. This type of analytics is often used to answer questions like "What happened?" and "Why did it happen?"

Descriptive analytics can provide HR teams with valuable insights into employee performance, engagement, and retention. For example, by analyzing data from employee surveys, HR teams can identify trends and patterns in employee satisfaction and engagement. This information can then be used to make improvements to the workplace and address any issues that may be negatively impacting employee morale.

Diagnostic Analytics

Diagnostic analytics takes descriptive analytics a step further by attempting to answer why something happened. This type of analytics involves digging deeper into the data to identify the root causes of certain trends or events.

For example, if an organization's employee turnover rate has increased, diagnostic analytics can help HR teams identify the reasons behind this trend. By analyzing data from exit interviews, performance evaluations, and other sources, HR teams can gain insights into why employees are leaving and what can be done to improve retention.

Predictive Analytics

Predictive analytics uses data to make predictions about future events or trends. This type of analytics is often used to answer questions like "What is likely to happen?" and "What will happen if we take a certain action?".

Predictive analytics can be incredibly valuable for HR teams, as it allows them to anticipate potential issues and take proactive measures to address them. For example, by analyzing data from employee surveys and performance evaluations, HR teams can identify employees who are at risk of leaving and take steps to improve their job satisfaction and engagement.

Prescriptive Analytics

Prescriptive analytics is the most advanced type of HR analytics. It involves using data to make recommendations for future actions. This type of analytics is often used to answer questions like "What should we do?" and "What is the best course of action?".

Prescriptive analytics can help HR teams make more informed decisions about everything from hiring and on boarding to employee development and retention. By analyzing data from a variety of sources, HR teams can gain insights into the most effective strategies for managing their workforce and achieving their goals.

These types of HR analytics help HR teams make data-driven decisions, improve workforce processes, and promote a positive employee experience.

Difference between HR Analytics and People Analytics

It has also been noticed that many people use the terms HR analytics and people analytics interchangeably. Let us put an end to the misconception and clarify the differences between them.

HR Analytics	People Analytics
Focuses on HR metrics and functions.	Covers a wide range of data, including HR metrics, and extends to broader business

	insights and workforce optimization.
The data and processes are HR-specific and within the HR department.	It expands beyond HR to cover cross-functional data from various departments.
Aims at optimizing HR processes and decision-making.	Aims to provide insights to drive strategic decisions across the entire organization.
Focuses on HR-specific metrics such as turnover rate, time to fill, training effectiveness, recruitment costs, etc.	Apart from HR metrics, it also focuses on employee engagement, productivity, workplace planning, financial impact, etc.

8 Fundamental HR Analytics Metrics

Today's competitive world demands a proper understanding of the importance of effective human resource management. Companies, in order to thrive and attain heights, must utilize the power of data-driven insights.

This is where the HR analytics metrics come into motion. These metrics are crucial indicators that show how effective these HR practices and strategic decisions are and how they contribute to the organization's success.

Let us dive into those significant HR analytics metrics in the following section:

Employee Turnover

This metric sheds light on the number of employees that are leaving the organization. High employee turnover indicates issues that the employees undergo concerning workplace satisfaction, leadership, or company culture.

Time to Fill

The metric measures the average time taken to fill open job positions. The longer time for filling the positions can lead to productivity gaps and added pressure on existing employees.

Cost per Hire

It gives you an insight into the cost of hiring a new talent. By understanding the total cost of bringing in new talent, you will get an idea of optimizing recruitment budgets while equally maintaining the quality of hires.

Employee Engagement Levels

This metric gives insight into the employees' engagement levels that keep them committed and motivated at work. Higher engagement levels go hand in hand with increased productivity and retention.

Training Effectiveness

The metric is suitable to measure the impact the training programs create on employees' skills and their subsequent performance. This factor is crucial in driving organizational growth and agility.

Performance Metrics

Role-specific performance metrics link an individual's contributions to overall business objectives. This makes it simpler for you to align goals and identify core areas for improvement.

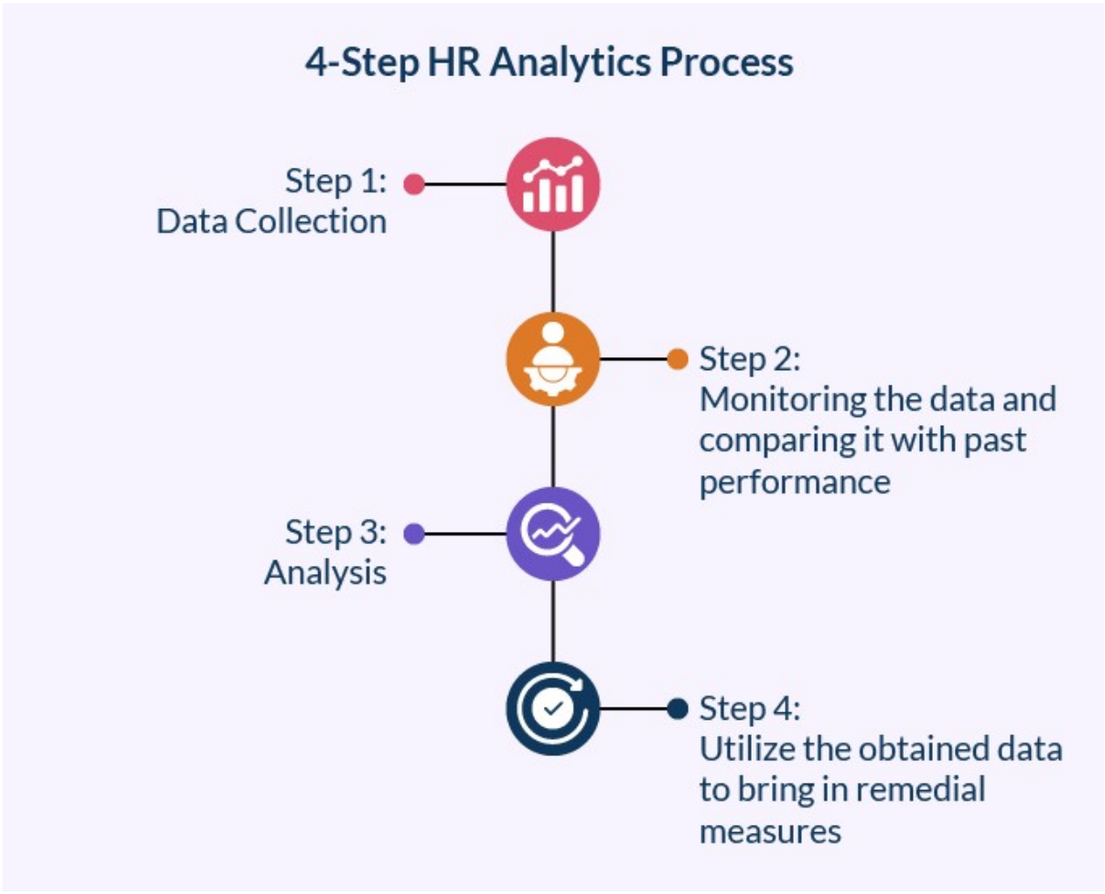
Absenteeism Rate

It tracks the rate at which employees miss out on their work. The absenteeism rate helps recognize patterns of employee absence, which can be related to either health or work-related issues.

Retention Rate

It shows the percentage of employees who stay with the organization for a certain period. A high retention rate shows how your organization keeps your employees satisfied and committed. This leads to stability in the workforce and a reduction in hiring costs.

Process of HR Analytics



The HR analytics process comprises four primary steps that are performed one after the other. These steps form the bedrock of measuring the impact of HR initiatives while staying aligned with the metrics.

Let us get a detailed understanding of the processes below.

Step 1: Data Collection

Data are just summaries of thousands of stories – tell a few of those stories to help make the data meaningful
– Chip & Dan Heath, authors of Made to Stick

Collecting and categorizing high-quality data is HR analytics's first and most vital step. Basically, there are two categories of data required for the process. They are as follows:

Internal Data: Employee Tenure, Employee Training Records, Data on high and low performers, Retention, Engagement, Turnover, Salary and Promotion History, Absenteeism.

External Data: Organization-wide financial data, Passive data from employees right from the recruitment stage, Core offerings of the organization, and Historical data.

Step 2: Monitoring the Data and Comparing it with Past Performance

The second step is all about continuous assessment and comparison of the obtained data. At this step, the HR metrics are calculated to measure the effectiveness of the HR initiatives.

The HR metrics considered for the HR Analytics process are showcased below.

Recruitment Metrics	**Engagement & Retention Metrics**	**Time Tracking Metrics**	**Employee Value and Performance Metrics**	**Training and Development Metrics**
Cost per Hire	Retention Rate	Absence Rate	Company Performance	Training Completion Rate
Time to Hire	Total Turnover Rate	Overtime Hours	Employee Performance	Training Expense per Employee
New-Hire Turnover	Voluntary Turnover Rate	Absence Rate per Manager	Revenue per Employee	Time to Completion
Headcount	Talent Turnover Rate		Goal Tracking	Training Effectiveness
Demographics	Employee Satisfaction		Performance and Potential	

Time to Productivity	Retention Rate per Manager			

Step 3: Analysis

After having assessed, compared, and calculated the HR metrics in the previous step, they can be analyzed further to identify the impact of HR initiatives and activities on the workforce.

The analytical methods commonly used in this process are as follows:

1. HR Descriptive Analytics

This particular type of HR analytics analyzes historical data to understand past happenings. The insights garnered from this analysis shed light on HR metrics such as turnover rates, employee engagement scores, recruitment scores, etc, and identifying trends and patterns. It helps HR professionals gain a clear picture of their workplace's current scenario.

2. HR Diagnostic analytics

This form of HR analytics is oriented toward determining the cause behind the issues or problems. To be precise, it focuses on identifying the root causes of HR issues or trends. For instance, if your company has a high turnover rate, diagnostic analytics will come into play to determine the reasons or causes behind the high turnover rate. It might result from company policies, poor management, low satisfaction, or low compensation packages. Figuring out the accurate cause will help you make and deal with the necessary changes.

3. HR Predictive Analytics

This form of HR analytics uses statistical models and historical data to forecast workforce trends and outcomes. HR professionals can forecast future turnover rates or recruitment needs through predictive analytics. It helps organizations to be proactive and take action prior to the occurrence of the problems.

4. HR Prescriptive Analytics

This form of HR analytics involves using data to prescribe or recommend specific actions to reach a certain outcome. It is more focused on providing guidance on actions to be undertaken to achieve desired results. For instance, prescriptive analytics might suggest specific, actionable steps to reduce turnover or improve employee engagement if the company struggles with them.

Step 4: Utilize the Obtained Data to Bring in Remedial Measures

Once the HR metrics have undergone the analysis step, the analyzed data is further utilized to make informed decisions. The insights drawn from the analysis help address the issues that hamper the organizational processes and likewise implement remedial measures and improvements in the HR metrics.

By understanding and leveraging these different types of HR analytics, organizations can make more informed, data-driven decisions about their workforce.

Examples of HR Analytics

HR analytics strategy can help us gather a clear understanding of the type of data and insight that can be extracted from it. Several types of data points and survey analysis are provided by the HR analytics framework. Some examples of the framework are listed below. Let us dive through them.

HR analytics is a process of collecting, analyzing, and interpreting HR data to make data-driven decisions and improve organizational performance. It involves understanding workforce dynamics, optimizing HR practices, and aligning talent strategies with business objectives.

Here's a more detailed look at the process:

1. Defining Business Questions and Identifying Data Sources:

- Start by identifying specific business questions or issues you want to address through HR analytics.
- Then, identify the relevant HR data sources, such as HRIS systems, employee surveys, performance reviews, and other relevant data.

2. Data Collection and Cleaning:

- Gather data from identified sources, ensuring data quality and accuracy.
- Clean the data by removing inconsistencies, errors, and missing values.

3. Data Analysis and Interpretation:

- Analyze the data using various statistical methods and techniques to identify trends, patterns, and insights.
- Interpret the findings to understand the root causes of issues and potential areas for improvement.

4. Developing Action Plans and Recommendations:

- Based on the insights gained from data analysis, develop specific action plans and recommendations.
- These plans should address the identified issues and align with the organization's strategic goals.

5. Implementing Changes and Continuous Monitoring:

- Implement the recommended changes and closely monitor their impact on HR metrics and business performance.
- Continuously evaluate the effectiveness of the changes and make adjustments as needed.

LAMP framework in HR analytics

The LAMP framework in HR analytics, developed by Professor John W. Boudreau, stands for Logic, Analytics, Measures, and Process. It's a model designed to help HR professionals leverage data for better decision-making. It provides a structured approach to understand and improve employee performance, promote strategic change, and enhance organizational effectiveness by focusing on the connections between HR factors and business outcomes.

Here's a breakdown of each component:

- **Logic:**

  This involves identifying the key questions and hypotheses about employee performance and the underlying logic behind HR decisions. It's about understanding the "why" behind HR interventions and establishing the connections between HR practices and business outcomes.

- **Analytics:**

  This component focuses on applying statistical and analytical techniques to HR data to uncover patterns, trends, and insights. It involves using data to answer questions and test hypotheses generated in the logic phase.

- **Measures:**

  This refers to the specific metrics and indicators used to track and evaluate employee performance. It's crucial to select relevant and accurate measures that provide actionable insights.

- **Process:**

  This component focuses on how the measurement system is implemented and managed within the organization. It includes defining goals, tracking progress, and making decisions based on the data analysis.

  By integrating these four components, the LAMP framework provides a comprehensive approach to HR analytics that can drive strategic change and improve organizational effectiveness. It emphasizes that simply having data is not enough; it needs to be analyzed within a logical framework, measured accurately, and implemented through a well-defined process.

What is the LAMP Framework in HR Analytics?

Organizations utilize the LAMP Framework in HR to comprehend and enhance employee performance. Logic, Analytics, Measures, and Process are referred to as LAMP.

This framework offers an organized method for gathering, evaluating, and leveraging employee performance data to inform organizational effectiveness and drive strategic change.

The LAMP framework is used to pinpoint and evaluate the elements that affect employee performance inside a company and to comprehend how the many facets of employee behavior relate to one another and how they impact overall performance.

Organizations may use this framework to develop a measuring system that will aid in understanding and enhancing employee performance, promoting strategic change, and enhancing organizational effectiveness.

Logic: This framework element refers to the methodical and logical process of discovering the pertinent data and metrics required to assess and enhance employee performance.

Analytics: This part of the framework examines the determined data and metrics to gather knowledge and spot patterns and trends.

Measures: The exact metrics and indicators used to track and evaluate employee performance are included in this framework section.

Process: This part of the framework refers to how the measuring system is implemented and managed, including how goals are created, progress is tracked, and decisions are made in light of the data.

Organizations may use this framework to develop a measuring system that will aid in understanding and enhancing employee performance, promoting strategic change, and enhancing organizational effectiveness.

Why is the LAMP Framework Important in HR Analytics?

In HR analytics, the LAMP Framework is crucial since it aids firms in:

Identify the critical aspects that affect employee performance: Organizations may use the framework to pinpoint the main elements that affect employee performance, including leadership, attitudes, and motives.

Measure and track employee performance: Employee performance is measured and tracked using a framework that offers a systematic method for selecting and monitoring the metrics used.

Analyse data to generate insights: Organizations may uncover patterns and trends to help them understand and enhance employee performance by studying the data and metrics.

Take action to improve performance: To enhance performance, take action. The framework offers a mechanism for doing so based on the insights drawn from the data, including defining goals, tracking advancement, and implementing adjustments.

Drive strategic change and organizational effectiveness: Boost employee performance, which in turn may boost corporate energy and strategic change: By utilizing the LAMP Framework, businesses can raise employee performance.

Companies may utilize the LAMP Framework as a reliable tool to understand employee performance better and make data-driven decisions that can enhance the entire organization’s performance.

Top Benefits of Using LAMP Framework

The following are the main advantages of applying the LAMP Framework to HR analytics:

Better decision-making: The LAMP Framework offers an organized method for gathering, evaluating, and analyzing data, enabling firms to choose more wisely regarding hiring, training, and performance management.

Enhanced employee performance: Organizations may enhance and boost productivity by utilizing the framework to recognize and comprehend the elements that affect employee performance.

Better employee retention: Organizations may enhance employee satisfaction and lower turnover by utilizing data to understand better the elements that affect employee attitudes and motivations.

Enhanced organizational effectiveness: Organizations may drive strategic transformation and boost organizational effectiveness by utilizing the LAMP Framework to improve employee performance.

Cost savings: Organizations may make adjustments that can save time and money by using data to pinpoint weak areas.

Identifying critical areas for improvement: Organizations may prioritize the changes that will have the most impact by prioritizing the essential regions where improvements can be made based on data analysis.

Identifying patterns and trends: Patterns and trends in employee performance may be found using the LAMP Framework, which enables firms to forecast future performance and implement proactive adjustments.

Evidence-based decision-making: Organizations may guarantee that judgments are founded on facts rather than assumptions by employing data and evidence, which can enhance the decision-making process.

How to Implement the LAMP Framework in HR Analytics?

Here is a step-by-step tutorial for putting the LAMP Framework into practice in HR analytics:

Determine the primary elements that impact employee performance: Use the LAMP Framework to pinpoint the critical variables that affect employee performance, such as management style, employee attitudes, and employee motivation.

Find the pertinent measurements and data: Determine the information and metrics necessary for tracking and evaluating employee performance.

Data collection and organization: Gather pertinent data and arrange it so it is simple to examine and decipher.

Analyze the data: You may discover patterns and trends in employee performance by analyzing the data and using analytics tools.

Set targets and create action plans: To increase employee performance, define goals and develop action plans based on the insights revealed by the data.

Implement the action plans: To enhance employee performance, implement the strategies and make any required adjustments.

Monitor progress and make adjustments: To ensure the action plans are successful, monitor the progress and make any revisions.

Share the findings: Share the results with the appropriate parties, including management and staff, to ensure that everyone is aware of the changes and their effects.

Continuous Improvement: Make adjustments to the process after collecting input and reviewing the outcomes.

It's crucial to remember that the LAMP Framework deployment may necessitate a shift in the corporate culture, mainly if the organization is not accustomed to leveraging data and evidence-based decision-making.

As a result, getting everyone on board is critical to properly explaining the process and advantages to the pertinent stakeholders.

Where can the LAMP framework be applied in HR analytics?

Examples of how the LAMP Framework may be used in HR analytics are given below:

Recruiting: Organizations may determine the elements that affect the effectiveness of recruitment efforts by utilizing the LAMP Framework, including the sources of applicants, the hiring procedure, and the kind of job offers.

The recruiting process may be better with this information, raising the likelihood of selecting the best individuals.

Employee Development: Organizations may pinpoint the elements that affect employee development, such as training programs, mentoring relationships, and possibilities for career advancement, by utilizing the LAMP Framework.

The information provided can aid in designing and implementing employee development programs that are more successful in raising employee performance.

Performance Management: Organizations may pinpoint the elements that affect employee performance, such as work-life balance, motivation, and job satisfaction, by utilizing the LAMP Framework.

Performance management systems that are more successful in enhancing employee performance may be designed and implemented using the information provided.

Employee Retention: Organizations may discover the elements that affect employee retention, such as work-life balance, employee engagement, and job satisfaction, by utilizing the LAMP Framework.

Using the information provided, designing and implementing retention strategies that are more successful in lowering turnover and keeping top personnel.

Talent Management: Employee engagement, succession planning, and leadership development are a few examples of the characteristics that firms may identify utilizing the LAMP Framework for talent management.

Using this knowledge, talent management plans may be created and put into action that are better at attracting, developing, and keeping elite personnel.

Employee Benefits: Organizations may identify the variables that affect employee benefits, such as employee happiness, engagement, and turnover rate, by utilizing the LAMP Framework.

With the aid of this knowledge, employee benefit plans can be created and put into action in a way that will increase employee retention and satisfaction.

Tips and best practices for using LAMP Framework

For implementing the LAMP Framework in HR analytics, consider the following guidelines and best practices:

Start with a clear objective: It's crucial to grasp the project's aims and objectives before using the LAMP Framework.

This will make it easier to ensure that the measurements and data gathered and evaluated are pertinent to the objective.

Involve key stakeholders: Key stakeholders should be involved in ensuring the LAMP Framework's success, including HR managers, staff members, and business executives.

Insights and data will be more applicable to the company, and the action plans will be more doable and practical.

Utilize many data sources: The LAMP Framework may be used with several data sources, including survey results, performance statistics, and demographic information.

It is possible to have a more complete view of employee performance by utilizing various data sources.

Use the right analytics tools: The LAMP Framework needs the right tools to analyze the data and obtain insights.

These resources may include machine learning, data visualization, and statistical analysis.

Properly communicate results and action plans: Effectively communicating them to the appropriate stakeholders, including managers and employees, is critical.

Ensuring everyone is informed of the changes and their effects will assist.

Continuously evaluate and tweak: Keep an eye on developing the action plans and tweak them as necessary to ensure they work.

Continually obtain input, examine findings, and make necessary process updates.

Observe the steps: To find, measure, and analyze data linked to employee performance and use this data to drive strategic change and organizational effectiveness,.

HR MEASUREMENT AND PURPOSES

HR measurement uses quantitative data to assess the efficiency and effectiveness of HR practices, helping organizations track key workforce activities like recruitment, retention, training, and employee performance. The purpose of HR measurement is to provide insights for data-driven decision-making, optimizing HR processes, and ultimately boosting overall organizational performance. HR measurement quantifies what HR is doing, as well as the performance of employees. These are extremely important measurements as they offer a trackable and measurable way of understanding the company's financial health.

Why is HR measurement important?(PURPOSES)

- **Strategic Talent Management:**

  HR metrics help identify talent needs and gaps, guiding strategic decisions in recruitment, development, and retention.

- **Cost Optimization:**

  By analyzing recruitment, training, and turnover costs, HR metrics assist in budgeting and identifying cost-saving opportunities.

- **Process Improvement:**

  HR metrics identify areas where processes can be optimized and improved, leading to better efficiency and effectiveness.

- **Alignment with Business Goals:**

  By tracking key metrics, HR can ensure that its strategies and programs are aligned with the organization's overall goals.

- **Measuring HR Effectiveness:**

  HR metrics allow for the measurement of the overall effectiveness of the HR department and its impact on the organization.

- **Demonstrating HR Value:**

  By tracking and analyzing data, HR can demonstrate its value to the organization and justify investments in HR initiatives.

What are some examples of HR metrics?

- **Turnover Rate:** Measures the percentage of employees who leave the organization over a specific period.
- **Time-to-Hire:** Tracks the time it takes to fill a vacant position.
- **Cost-per-Hire:** Calculates the total cost associated with hiring a new employee.
- **Employee Engagement Score:** Measures employee engagement and satisfaction levels.
- **Training Effectiveness:** Evaluates the effectiveness of training programs in improving employee skills and knowledge.
- **Employee Performance:** Tracks employee performance and productivity.
- **Absenteeism Rate:** Measures the frequency of employee absences.
- **Revenue per Employee:** Calculates the revenue generated by each employee.
- **Employee Satisfaction:** Measures employee satisfaction with their jobs and the workplace.

Introduction to HR data

HR data, or human resource data, is information and metrics collected by the HR department to manage employees, candidates, and other aspects of personnel management. It's crucial for informed decision-making, such as in recruitment, compensation, and succession planning, and helps understand workforce trends. This data can be used for various purposes, including improving recruitment processes, enhancing employee engagement, and reducing turnover.

Key aspects of HR data:

- **Data Collection:**

  HR data is gathered from various sources, including employee records, performance evaluations, engagement surveys, compensation data, and even exit interviews.

- **Data Analysis:**

  Once collected, the data is analyzed using statistical methods, machine learning algorithms, and data visualization techniques.

- **Data-driven Decision-Making:**

  HR analytics provides insights that enable informed decisions related to recruitment, retention, talent development, and workforce planning.

- **Types of HR Analytics:**

  HR analytics encompasses various approaches, including descriptive, diagnostic, predictive, and prescriptive analytics.

- **Examples of HR Data:**

  HR data includes employee profiles, performance data, compensation and salary history, demographic data, training records, engagement metrics, retention data, and turnover rates.

- **Benefits of HR Data:**

  Utilizing HR data can lead to a variety of benefits, such as reducing workforce turnover, improving performance and productivity, improving training programs, increasing employee engagement, and creating a better work environment.

- **Compliance Risk Reduction:**

  HR data analytics can also help organizations manage compliance risks more effectively by monitoring compliance measures, detecting risks, and evaluating potential outcomes for non-compliance issues.

IMPORTANCE OF HR DATA

HR data, especially when used along with HR analytics, can provide valuable insights into your workforce. It can reveal trends, patterns, and correlations that will help you make better business decisions.
HR data is crucial for informed decision-making, improved workforce management, and ultimately, achieving organizational success. By analyzing HR data, companies can identify trends, predict future needs, optimize hiring processes, enhance employee engagement, and mitigate risks, leading to better productivity, higher retention, and cost savings.

Here's a more detailed look at why HR data is important:

1. Strategic Decision-Making:

- **Evidence-based HR practices:**

  HR data provides evidence to support HR decisions, moving them away from guesswork and towards data-driven insights.

- **Predictive analytics:**

  HR analytics can forecast future trends, such as talent needs, turnover rates, and skill gaps, allowing organizations to proactively plan and mitigate risks.

- **Optimized workforce planning:**

  Data helps in identifying the right talent mix, optimizing resource allocation, and aligning HR efforts with business objectives.
  2. Enhanced Employee Experience and Engagement:

- **Understanding employee sentiment:**

  HR data can uncover what drives employee satisfaction, engagement, and retention, enabling targeted interventions to improve morale and reduce turnover.

- **Personalized development:**

  Data can identify individual skill gaps and tailor training programs to improve employee performance and development.

- **Improved manager effectiveness:**

  HR analytics can identify top leaders and assess their impact on employee engagement, retention, and productivity.

3. Increased Productivity and Cost Savings:

- **Identifying high performers:**

  Data helps identify top performers and effective teams, enabling organizations to leverage their expertise and create high-performing units.

- **Optimized processes:**

  HR analytics can identify areas where processes are inefficient, leading to cost savings and improved efficiency.

- **Reduced turnover:**
  By understanding the root causes of employee turnover, organizations can implement targeted retention strategies and reduce the costs associated with high turnover.
  4. Risk Mitigation and Compliance:

- **Compliance with regulations:**

  HR data helps ensure compliance with labour laws, health and safety regulations, and industry standards, minimizing legal risks.

- **Monitoring diversity and inclusion:**

  Data can be used to track diversity and inclusion metrics, identify potential biases, and implement strategies to promote a more inclusive workforce.

- **Preventing reputational damage:**
  HR data can help identify potential risks to an organization's reputation, such as employee dissatisfaction or unethical practices, allowing for proactive mitigation.
  5. Demonstrating HR Value:

- **Business partnering:**

  By leveraging data, HR can demonstrate its value to the organization and become a strategic business partner.

- **Justifying HR investments:**

  HR analytics can showcase the return on investment (ROI) of HR initiatives, making it easier to secure funding and resources.

- **Measuring HR effectiveness:**
  HR metrics help track the effectiveness of HR programs and identify areas for improvement, ensuring that HR resources are used efficiently.
  In essence, HR data is not just about collecting information; it's about transforming data into actionable insights that drive business success and improve the employee experience.

Types of hr data

Data is broadly classified into qualitative and quantitative, with further subdivisions. Qualitative data includes nominal and ordinal, while quantitative data includes discrete and continuous. Additionally, data can be structured, semi-structured, or unstructured.

Here's a more detailed breakdown:

1. Qualitative Data:

- **Nominal:**

  This type of data represents categories without any inherent order or ranking. Examples include gender, eye colour, or marital status.

- **Ordinal:**
  This data has a natural order or ranking, but the intervals between categories may not be equal. Examples include survey responses (strongly agree, agree, neutral, disagree, strongly disagree) or educational levels (high school, bachelor's, master's).
  2. Quantitative Data:

- **Discrete:**

  This data represents whole numbers or counts that can be separated into distinct values. Examples include the number of students in a class, the number of defects in a product, or the number of cars passing a certain point.

- **Continuous:**
  This data can take on any value within a given range, including fractions and decimals. Examples include height, weight, temperature, or time.
  3. Additional Data Types:

- **Boolean:**

  This data type represents true or false values, often used for logical operations.

- **Character/String:**

This data type represents text or sequences of characters, like names, addresses, or descriptions.

- **Structured Data:**

  This data is organized in a predefined format, such as a relational database table.

- **Semi-structured Data:**

  This data has some structure but is not as rigidly defined as structured data, such as XML or JSON.

- **Unstructured Data:**

  This data does not have a predefined format, such as text documents, images, or audio files.

- **Numeric Data:**

  This encompasses various types of numbers, including integers (whole numbers) and floating-point numbers (decimal numbers).
  Understanding these different data types is crucial for choosing appropriate analysis methods and ensuring accurate interpretations.

  HR data is broadly categorized into four main types: descriptive, diagnostic, predictive, and prescriptive analytics. These types help HR professionals understand past trends, identify root causes, forecast future outcomes, and recommend actions to optimize workforce practices.
  These four types of analytics, when used effectively, can empower HR professionals to make data-driven decisions, optimize workforce practices, and improve overall organizational performance.

Sources Of Hr Data

HR data comes from internal sources like HR systems (HRIS), recruitment systems (ATS), and employee surveys, as well as external sources such as job boards and salary benchmarking data. Key internal sources include employee records, compensation data, performance reviews, and learning management system data. External sources can include market research, competitor data, and industry reports.

Internal HR Data Sources:

- **HRIS (Human Resources Information System):**

  The central database for employee information, including demographics, job history, compensation, and performance data.

- **ATS (Applicant Tracking System):**

  Tracks the recruitment process, including job postings, applications, and candidate tracking.

- **LMS (Learning Management System):**

  Manages employee training and development programs, providing data on course participation and completion.

- **Employee Surveys:**

  Gather insights into employee engagement, satisfaction, and feedback on various aspects of the workplace.

- **Performance Management Systems:**

  Track employee performance, goals, and achievements.

- **Compensation and Benefits Data:**

  Records salary information, benefits packages, and compensation structures.

- **Succession Planning:**

  Data on potential successors and their skills and development needs.

- **Exit Interviews:**

  Gather information from departing employees about their reasons for leaving and feedback on the company.

- **Absence Data:**

  Tracks employee absences, including sick leave, vacation, and other types of leave.

- **Employee Records:**

  Contains detailed information about each employee, including personal data, contact information, and job history.

External HR Data Sources:

- **Job Boards:** Data on job postings, candidate profiles, and market trends.
- **Salary Benchmarking Databases:** Provide salary data for various roles and industries.
- **Competitor and Industry Reports:** Offer insights into competitor strategies, industry trends, and market dynamics.
- **Government and Compliance Databases:** Provide data on legal requirements, regulations, and industry standards.
- **Professional Social Networks:** Platforms like LinkedIn can provide insights into candidate profiles, skills, and industry trends.

- **Market Research:** Data on industry trends, skill gaps, and emerging technologies.

Types and Scales of Data, reliability and validity of data

Data types can be broadly classified into categorical and numerical, while scales of measurement include nominal, ordinal, interval, and ratio. Reliability refers to the consistency of a measurement, while validity refers to whether the measurement accurately reflects the concept it's intended to measure.

Scales of Measurement

- **Nominal:**

  Categories with no inherent order (e.g., colors, types of fruit).

- **Ordinal:**

  Categories with a meaningful order, but the intervals between them are not necessarily equal (e.g., rankings, satisfaction levels).

- **Interval:**

  Ordered categories with equal intervals, but no true zero point (e.g., temperature in Celsius or Fahrenheit).

- **Ratio:**

  Ordered categories with equal intervals and a true zero point (e.g., height, weight, age).

  Reliability

  - **Test-retest reliability:** Consistency of measurements over time.
  - **Inter-rater reliability:** Consistency between different observers or raters.
  - **Internal consistency:** Consistency of items within a measurement instrument (e.g., a questionnaire).

  Validity

  - **Face validity:** Whether a measure appears, on the surface, to measure what it's supposed to.
  - **Content validity:** Whether the measure covers the full range of the concept being measured.
  - **Criterion validity:** Whether the measure correlates with other measures of the same concept.
  - **Construct validity:** Whether the measure aligns with theoretical constructs.
    - **Convergent validity:** The measure correlates with other measures of the same construct.
    - **Discriminant validity:** The measure does not correlate with measures of different constructs.

  Relationship between Reliability and Validity

  A measurement can be reliable (consistent) but not valid (accurate). For example, a broken scale might consistently give the same weight (reliable), but it will not be accurate (valid). Conversely, a measurement can be valid but not reliable if it accurately measures the concept but not consistently. For a measurement to be truly useful, it needs to be both reliable and valid.

HR data examination

HR data examination, also known as HR analytics, involves collecting, analyzing, and interpreting data related to human resources to improve decision-making and workforce management. This process helps organizations gain insights into employee demographics, performance, engagement, and other aspects of their workforce.

Key aspects of HR data examination:

- **Data Collection:**

  Gathering information from various sources within the HR system, including employee records, performance reviews, recruitment data, and engagement surveys.

- **Data Analysis:**

  Using statistical methods and data visualization techniques to identify trends, patterns, and insights within the data.

- **Data Interpretation:**

  Understanding the meaning of the findings and drawing conclusions that can inform HR strategies and initiatives.

- **Decision Making:**

  Using the insights gained from the analysis to make data-driven decisions about recruitment, compensation, talent development, and other HR functions.

Benefits of HR Data Examination:

- **Improved Decision Making:**

  Provides data-driven insights to support better decisions about recruitment, training, compensation, and other HR practices.

- **Enhanced Workforce Management:**

  Helps identify areas for improvement in employee performance, engagement, and retention.

- **Increased Efficiency:**
  Streamlines HR processes and optimizes resources through data-driven insights.
- **Strategic Alignment:**
  Aligns HR practices with business goals and objectives through data-driven analysis.
  Examples of HR data analysis:
- **Turnover Analysis:**
  Identifying factors contributing to employee turnover and implementing strategies to reduce it.
- **Engagement Analysis:**
  Measuring employee engagement and identifying areas where engagement can be improved.
- **Performance Analysis:**
  Evaluating employee performance and identifying top performers and areas for improvement.
- **Recruitment Analysis:**
  Assessing the effectiveness of recruitment efforts and identifying areas for improvement.
- **Compensation Analysis:**
  Comparing compensation and benefits packages to market trends and ensuring fairness and equity.
  Common HR Metrics:
  - **Headcount:** Total number of employees in the organization.
  - **Turnover:** The rate at which employees leave the organization.
  - **Diversity:** Representation of different demographics within the workforce.
  - **Employee Engagement:** The level of employee commitment and involvement in their work.
  - **Absenteeism:** The rate at which employees are absent from work.
  - **Cost of Hiring:** The total cost associated with recruiting and onboarding new employees.
  - **Employee Satisfaction:** Measures of employee satisfaction with various aspects of their work.
  - **Performance Ratings:** Assessments of employee performance based on specific metrics.

HR DATA PURIFICATION

Data cleansing is the process of finding and removing errors, inconsistencies, duplications, and missing entries from data to increase data consistency and quality—also known as data scrubbing or cleaning. While organizations can be proactive about data quality in the collection stage, it can still be noisy or dirty.
HR data purification, also known as HR data cleansing or scrubbing, is the process of ensuring HR data is accurate, consistent, and reliable before using it for analysis or decision-making. This involves identifying and correcting errors, inconsistencies, duplicates, and missing data.

Why is HR data purification important?

- **Accurate analysis:** Dirty data can lead to inaccurate insights and flawed decisions.
- **Trust and confidence:** Clean data builds trust in HR analytics and encourages stakeholders to embrace data-driven decisions.
- **Efficiency:** Cleaning data before analysis saves time and effort in the long run.
- **Interoperability:** Clean data is more easily shared and integrated across different systems.
- **Compliance:** Accurate data ensures compliance with HR regulations and policies.
  Steps in HR data purification:

1. **Data collection:** Gather HR data from various sources like HRIS, payroll systems, and other HR tools.
2. **Data validation:** Identify data quality issues like missing values, incorrect formats, inconsistencies, and duplicates.
3. **Data cleaning:** Correct or remove errors, inconsistencies, and duplicates.
4. **Data transformation:** Convert data into a consistent format for analysis.
5. **Data storage:** Store cleaned data in a reliable and accessible database.
6. **Data monitoring:** Regularly monitor data quality to prevent errors from re-emerging.
   Tools and techniques for HR data purification:

- **Spreadsheets:** Basic data cleaning and formatting can be done in spreadsheets.
- **Data validation rules:** Define rules to ensure data conforms to expected formats and values.
- **Data quality tools:** Specialized software for identifying and correcting data quality issues.
- **Data profiling:** Analyze data to identify patterns, trends, and anomalies.
- **Data integration platforms:** Combine data from multiple sources into a unified view.
  Benefits of HR data purification:
- **Improved decision-making:**

Accurate data allows for more informed decisions about recruitment, training, compensation, and other HR strategies.

- **Enhanced employee experience:**

  Clean data ensures accurate and reliable information for employees, improving their experience.

- **Increased productivity:**

  Data quality issues can lead to wasted time and resources. Cleaning data can streamline HR processes and improve efficiency.

- **Better compliance:**

  Accurate data ensures compliance with legal and regulatory requirements.

- **Stronger business case for HR:**

  Clean data provides a stronger foundation for HR analytics and demonstrates the value of HR to the business.

HR DATA PURIFICATION

Data cleaning is a key element in HR analytics. Before you can analyze your data, it needs to be 'clean'. In this data cleaning guide, we will explain why data cleaning is important and how you can do it. At the bottom of the article we included a helpful data cleaning info graphic.

A common saying in data analysis is: "garbage in, garbage out".

This saying means that you can put a lot of thought and effort into your data analysis and come up with lots of results. However, these results will mean nothing if the input data is not accurate. In fact, the results may even be harmful as they can misrepresent reality.

Why is data cleaning important?

HR data is oftentimes dirty. Dirty data is any data record that contains errors. This can happen for different reasons.

The simplest one being missing data. Other examples of dirty data are different labels for one and the same job functions, multiple records for the same people in one system, non-matching records in different systems, and so on.

Cleaning and ordering this data can be a time-consuming process. Indeed, aggregating data from all these different data sources and making them compliant can take weeks or even months. This holds especially true for international companies. These often use different systems in different countries to record the same data.

The problem with data is that it's easy to get dirty. As soon as data collection procedures differ in the slightest, the data will become inconsistent.

As a company, you can decide to clean all your data at once. Some companies opt for this strategy. However, this can take tremendous amounts of time. It is hence much smarter to clean only the data you need to perform a specific analysis.

This approach will prevent a lot of unnecessary work and produce results faster. Based on the outcomes of the first analysis, you can determine which extra data you need to clean to run your next analysis.

Data cleaning helps to run a smooth analysis. It also helps normal HR reporting as clean data can be fed back into the HR systems. This will help improve the data quality and is extremely beneficial for later data analyses and data aggregation efforts.

Data cleaning is thus a necessary step in the HR analytics process.

The data cleaning process

When cleaning HR data there are two things you need to understand. The first is data validity and the second is data reliability.

When data is not valid or reliable, it may tell you something different than what you are looking for. The following section will explore this deeper. It is important to understand these two terms. However, if you're looking for a more practical step-by-step guide, you can scroll down to the next section.

Validity

Validity is whether you're actually measuring what you need to measure. Does the appraisal system only measure individual performance, or does it (also) measure who is best liked by his/her manager? Is data collected evenly throughout the organization, or is it skewed in one way or another?

An example: The city of Boston made an app that their drivers could install on their Smartphone. The app would measure bumps in the road and report their location via GPS. These bumps were then recorded and the city road service would fix them. According to a spokesperson: "the data provides the city with real-time information it uses to fix problems and plan long-term investments".

Unfortunately, not everyone benefited equally from this system. The app was mainly used by the young and in more affluent communities. Meanwhile, the poorer communities did not have equal access to smartphones and mobile data. This is a significant bias in the data.

Questions you can ask yourself to check for validity, are:

1. Does the data represent what we want to measure?
2. Are there any biases in the way we measured our data?
3. Was the data collected in a clear and consistent way?
4. Are there outliers in the data?

Reliability

Reliability is about measuring the same thing over and over again and achieving the same result.

When you measure someone's engagement in the morning you want to have a similar result as when you measure it again in the afternoon. This is because engagement is a trait that is relatively stable over time.

The same holds true for different raters. If you ask both Bill and Jim to rate Wendy's engagement, you want both Bill and Jim to give Wendy the same rating. However, when the scales that are used to rate Wendy are vague and open to different interpretations, Bill and Jim will likely give Wendy different ratings. This is called a rater bias and is best avoided.

This might sound obvious but it is not. Oftentimes reported data depends on other factors like the instructions that are given, and the mood of the person who gives the rating. This is the big question when we talk about reliability: Are the same scores achieved when the same data is measured in the same way by different people and at different times of the day/week?

Procedures play an important role in this process. In rating performance, if one manager considers an employee's performance over the last six months, while another only thinks back over the last two weeks, performance ratings will likely differ and be unreliable. Clearly documented procedures would help different managers measure performance the same way.

Questions you should ask yourself in this context, are:

1. Did we consistently produce the same results when the same thing was measured multiple times?
2. Did we use clearly documented data collection methods?
3. Were data collection instructions followed each time?

A simple data cleaning checklist

The previous questions on validity and reliability help you to analyze whether your input data is sufficiently accurate to yield reliable and valid results. There are several other criteria your data needs to comply with. For example, your data needs to be up to date.

Data that is outdated will produce potentially irrelevant results and can potentially mess up your results. Additionally, you need to check if you have all the relevant data: records are oftentimes missing. Depending on how you analyze your data, this may or may not cause problems. Some methods of analysis allow for missing data while other algorithms struggle when data is missing.

Missing data will narrow your population. Plus, there is a real chance that there are shared similarities between the people whose data is missing. For instance, if one department still uses an outdated performance management system that omits certain questions, it would mean that you'd lack data of all the

people working in that department. This can seriously skew your results towards the other departments and threaten the generalizability of the results.

This is a practical checklist with six steps for data cleaning:

1. **Check if the data is up-to-date.**
2. **Check for recurring unique identifiers.** Some people hold more than one positions. Systems often create separate records for each position. These people thus end up having multiple records in a single database. Depending on the situation, these records may be condensed.
3. **Check data labels across multiple fields and merged datasets and see if all the data matches.**
4. **Count missing values.** When missing values are over-represented in specific parts of the organization, they may skew your results. We saw this in the previous example. In addition, an analysis with too many missing values (i.e. insufficient data) runs the risk of becoming inaccurate. This also impacts the generalizability of your results.
5. **Check for numerical outliers.** Calculate the descriptive statistics and the values of the quartiles. These enable you to calculate potential outliers. The minimum and maximum values are a good starting point.
   In addition, you can calculate the interquartile range. You can do this by multiplying the difference between quartile 3 (Q3) and Q1 by 1.5. The result can be added to Q3 and subtracted from Q1. Values outside this range are assumed to be outliers.
6. **Define valid data output and remove all invalid data values.** This is useful for all data. Character data is clearly defined. For example, gender is defined by M or F. These are the valid data values. Any other values are presumed to be invalid. This data can be easily flagged for inspection.

Data Visualization and Descriptive Analytics:

Descriptive statistics

Descriptive statistics are used to summarize and describe the key features of a dataset, providing a concise overview of its characteristics without making inferences about a larger population. They focus on organizing, presenting, and summarizing data to highlight important aspects like central tendency and variability.

Key Aspects of Descriptive Statistics:

- **Summarization:**
  Descriptive statistics condense large datasets into simpler, more manageable forms.
- **Description:**
  They describe the characteristics of the data, such as its average, spread, and distribution.
- **Organization:**
  They help organize data using tables, charts, and graphs to make it easier to understand.
  Common Types of Descriptive Statistics:

1. Measures of Central Tendency:

These describe the center or average of a dataset.

- **Mean:** The average of all values.
- **Median:** The middle value when data is ordered.
- **Mode:** The value that appears most frequently.

2. Measures of Variability (Dispersion):

These describe how spread out or dispersed the data is.

- **Range:** The difference between the highest and lowest values.
- **Variance:** Measures how spread out the data is from the mean.
- **Standard Deviation:** The square root of the variance, providing a measure of spread in the original units.

3. Frequency Distribution:

This shows how often each value or range of values occurs in the dataset.

4. Graphical Representations:
Charts and graphs like histograms, bar charts, and box plots help visualize the distribution and characteristics of the data.
Examples:

- Calculating the average age of students in a class.
- Determining the range of scores on a test.
- Creating a histogram to show the distribution of income levels in a city.

Descriptive statistics are essential for understanding the basic nature of a dataset and form the foundation for more advanced statistical analysis.

MEASURES OF FREQUENCY

In Human Resource Management (HRM), frequency measures are used to track how often certain events or situations occur within an organization, providing insights into various aspects of workforce management. Common examples include absenteeism rate, turnover rate, and training frequency. These metrics help HRM professionals understand trends, identify potential problems, and evaluate the effectiveness of HR strategies and initiatives.

Here's a more detailed look at some key frequency measures in HRM:

1. Absenteeism Rate:

- This metric measures the frequency of employee absences, whether due to illness, personal reasons, or other factors.
- It helps identify potential issues related to employee well-being, work-life balance, or workplace environment.
- The formula is: (Number of absent days / Total working days) * 100.

2. Turnover Rate:

- Turnover rate tracks the frequency of employees leaving the organization within a specific period.
- It can be further categorized into voluntary turnover (employee-initiated departures) and involuntary turnover (employer-initiated departures).
- High turnover rates can indicate issues with employee satisfaction, compensation, or career development opportunities.
- The formula is: (# Terminations during period / # Employees at beginning of period) * 100.

3. Training Frequency:

- This metric tracks how often employees participate in training programs.
- It can be measured by the number of training sessions attended, the number of training hours completed, or the percentage of employees trained within a given timeframe.
- Understanding training frequency helps assess the effectiveness of training programs and identify potential gaps in employee skills and knowledge.

4. Time to Hire:

- This metric measures the average time it takes to fill a vacant position, from initial posting to the candidate's start date.
- It helps assess the efficiency of the recruitment process and identify areas for improvement.
- The formula is: (1st candidate time to hire in days + 2nd candidate time to hire + nth candidate time to hire) / Total number of jobs.

5. Overtime Hours:

- This metric tracks the number of overtime hours worked by employees.
- It can indicate workload imbalances, staffing shortages, or potential inefficiencies in work processes.
- Monitoring overtime hours helps HR and management identify areas where adjustments can be made to improve employee well-being and productivity.

6. Internal Mobility Rate:

- This metric measures the frequency of employees changing roles or departments within the organization.
- It indicates the organization's ability to retain and develop talent internally.
- High internal mobility can signify a positive work environment with opportunities for growth and advancement.

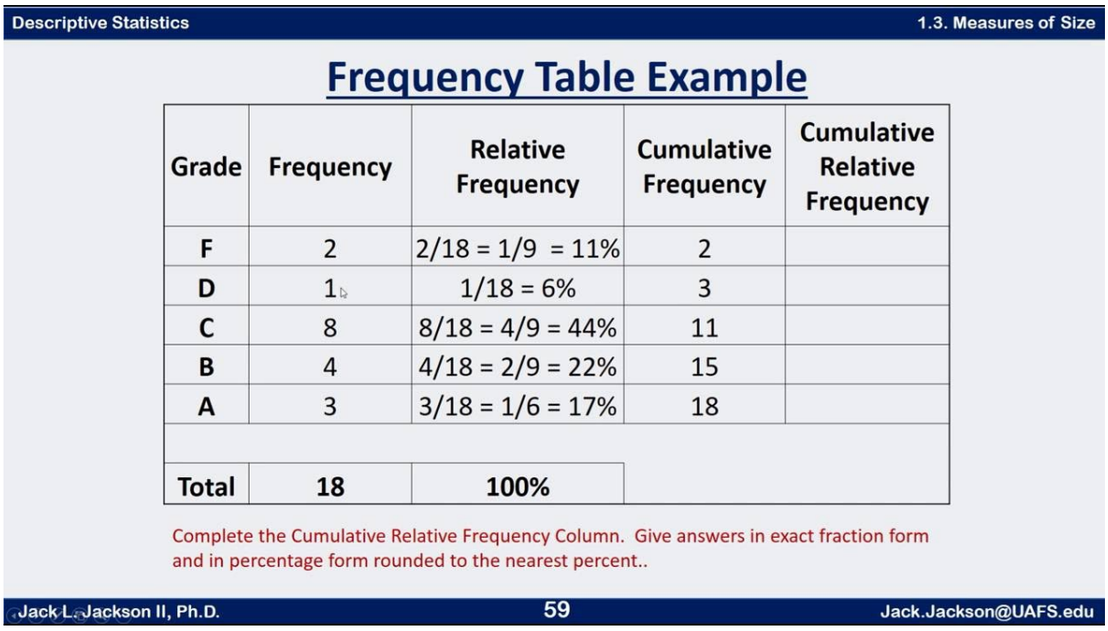
7. Diversity and Inclusion Metrics:

- These metrics track the representation of different demographic groups within the organization.
- They can include the percentage of employees from underrepresented groups, the representation of women in leadership roles, or the effectiveness of diversity and inclusion training programs.

8. Employee Engagement and Satisfaction:

- Metrics like the employee Net Promoter Score (eNPS) and employee satisfaction scores are used to gauge employee engagement and satisfaction.
- These metrics help understand how employees feel about their work, their team, and the organization as a whole.
- High engagement and satisfaction levels are often associated with increased productivity, lower turnover, and improved business outcomes.

By tracking these and other frequency-based metrics, HR professionals can gain valuable insights into workforce trends, identify areas for improvement, and make data-driven decisions to optimize HR strategies and initiatives.



A simple way to round off answers is to carry your final answer one more decimal place than was present in the original data. Round off only the final answer. Do not round off any intermediate results, if possible. If it becomes necessary to round off intermediate results, carry them to at least twice as many decimal places as the final answer. For example, the average of the three quiz scores four, six, and nine is 6.36.3, rounded off to the nearest tenth, because the data are whole numbers. Most answers will be rounded off in this manner.

Levels of Measurement

The way a set of data is measured is called its **level of measurement**. Correct statistical procedures depend on a researcher being familiar with levels of measurement. Not every statistical operation can be used with every set of data. Data can be classified into four levels of measurement. They are (from lowest to highest level):

- **Nominal scale level**
- **Ordinal scale level**
- **Interval scale level**
- **Ratio scale level**

Data that is measured using a **nominal scale** is **qualitative**. Categories, colors, names, labels and favorite foods along with yes or no responses are examples of nominal level data. Nominal scale data are not ordered. For example, trying to classify people according to their favorite food does not make any sense. Putting pizza first and sushi second is not meaningful.

Smartphone companies are another example of nominal scale data. Some examples are Sony, Motorola, Nokia, Samsung and Apple. This is just a list and there is no agreed upon order. Some people may favor Apple but that is a matter of opinion. Nominal scale data cannot be used in calculations.

Data that is measured using an **ordinal scale** is similar to nominal scale data but there is a big difference. The ordinal scale data can be ordered. An example of ordinal scale data is a list of the top five national parks in the United States. The top five national parks in the United States can be ranked from one to five but we cannot measure differences between the data.

Another example of using the ordinal scale is a cruise survey where the responses to questions about the cruise are “excellent,” “good,” “satisfactory,” and “unsatisfactory.” These responses are ordered from the most desired response to the least desired. But the differences between two pieces of data cannot be measured. Like the nominal scale data, ordinal scale data cannot be used in calculations.

Data that is measured using the **interval scale** is similar to ordinal level data because it has a definite ordering but there is a difference between data. The differences between interval scale data can be measured though the data does not have a starting point.

Temperature scales like Celsius (C) and Fahrenheit (F) are measured by using the interval scale. In both temperature measurements, 40°40° is equal to 100°100° minus 60°60°. Differences make sense. But 00 degrees does not because, in both scales, 00 is not the absolute lowest temperature. Temperatures like −10°−10° F and −15°−15° C exist and are colder than 00.

Interval level data can be used in calculations, but one type of comparison cannot be done. 80°80° C is not four times as hot as 20°20° C (nor is 80°80° F four times as hot as 20°20° F). There is no meaning to the ratio of 8080 to 2020 (or four to one).

Data that is measured using the **ratio scale** takes care of the ratio problem and gives you the most information. Ratio scale data is like interval scale data, but it has a 00 point and ratios can be calculated. For example, four multiple choice statistics final exam scores are 8080, 6868, 2020 and 9292 (out of a possible 100100 points). The exams are machine-graded.

The data can be put in order from lowest to highest: 2020, 6868, 8080, 9292.

The differences between the data have meaning. The score 9292 is more than the score 6868 by 2424 points. Ratios can be calculated. The smallest score is 00. So 8080 is four times 2020. The score of 8080 is four times better than the score of 2020.

Frequency

Twenty students were asked how many hours they worked per day. Their responses, in hours, are as follows: 55, 66, 33, 33, 22, 44, 77, 55, 22, 33, 55, 66, 55, 44, 44, 33, 55, 22, 55, 33.

The following table lists the different data values in ascending order and their frequencies.

DATA VALUE	FREQUENCY
22	33
33	55
44	33
55	66
66	22
77	11

Frequency Table of Student Work Hours

A **frequency** is the number of times a value of the data occurs. According to the table, there are three students who work two hours, five students who work three hours, and so on. The sum of the values in the frequency column, 2020, represents the total number of students included in the sample.

A **relative frequency** is the ratio (fraction or proportion) of the number of times a value of the data occurs in the set of all outcomes to the total number of outcomes. To find the relative frequencies, divide each frequency by the total number of students in the sample–in this case, 2020. Relative frequencies can be written as fractions, percents, or decimals.

DATA VALUE	FREQUENCY	RELATIVE FREQUENCY
22	33	320320 or 0.150.15
33	55	520520 or 0.250.25
44	33	320320 or 0.150.15
55	66	620620 or 0.300.30
66	22	220220 or 0.100.10
77	11	120120 or 0.050.05

Frequency Table of Student Work Hours with Relative Frequencies

The sum of the values in the relative frequency column of the previous table is 20202020, or 11.

Cumulative relative frequency is the accumulation of the previous relative frequencies. To find the cumulative relative frequencies, add all the previous relative frequencies to the relative frequency for the current row, as shown in the table below.

DATA VALUE	FREQUENCY	RELATIVE FREQUENCY	CUMULATIVE RELATIVE FREQUENCY
22	33	320320 or 0.150.15	0.150.15
33	55	520520 or 0.250.25	0.15+0.25=0.400.15+0.25=0.40

DATA VALUE	FREQUENCY	RELATIVE FREQUENCY	CUMULATIVE RELATIVE FREQUENCY
44	33	320320 or 0.150.15	0.40+0.15=0.550.40+0.15=0.55
55	66	620620 or 0.300.30	0.55+0.30=0.850.55+0.30=0.85
66	22	220220 or 0.100.10	0.85+0.10=0.950.85+0.10=0.95
77	11	120120 or 0.050.05	0.95+0.05=1.000.95+0.05=1.00

Frequency Table of Student Work Hours with Relative and Cumulative Relative Frequencies

The last entry of the cumulative relative frequency column is one, indicating that one hundred percent of the data has been accumulated.

NOTE

Because of rounding, the relative frequency column may not always sum to one, and the last entry in the cumulative relative frequency column may not be one. However, they each should be close to one.

Concept Review

Some calculations generate numbers that are artificially precise. It is not necessary to report a value to eight decimal places when the measures that generated that value were only accurate to the nearest tenth. Round off your final answer to one more decimal place than was present in the original data. This means that if you have data measured to the nearest tenth of a unit, report the final statistic to the nearest hundredth.

In addition to rounding your answers, you can measure your data using the following four levels of measurement.

- **Nominal scale level:** data that cannot be ordered nor can it be used in calculations
- **Ordinal scale level:** data that can be ordered; the differences cannot be measured
- **Interval scale level:** data with a definite ordering but no starting point; the differences can be measured, but there is no such thing as a ratio.
- **Ratio scale level:** data with a starting point that can be ordered; the differences have meaning and ratios can be calculated.

When organizing data, it is important to know how many times a value appears. How many statistics students study five hours or more for an exam? What percent of families on our block own two pets? Frequency, relative frequency, and cumulative relative frequency are measures that answer questions like these.

In HR, frequency measures quantify how often specific events or behaviours occur. Key examples include the frequency of accidents leading to absences, the frequency of employee training, and the frequency of employee engagement surveys. These measures help HR professionals assess risks, track learning, and gauge workforce morale and engagement.

Here's a breakdown of some common frequency measures in HR:

1. Accident Frequency Rate:

- This metric tracks the number of workplace accidents that result in at least one day's absence from work per a specific number of employee hours worked (usually one million).
- It's a key indicator of occupational safety and risk exposure within the workplace.

2. Training Frequency:

- This measures how often employees receive training, either in terms of the number of training sessions or the duration of training programs.
- It helps HR understand the effectiveness of training efforts and identify areas where more training might be needed.

3. Engagement Survey Frequency:

- This tracks how often employee engagement surveys are conducted.
- Regular engagement surveys allow for consistent measurement of employee morale and provide valuable data for HR to improve the work environment and employee experience.

4. Absenteeism Frequency:

- This metric measures how frequently employees are absent from work, often expressed as the percentage of working days missed due to absenteeism.
- It can indicate potential issues with employee well-being, satisfaction, or workload.

5. Turnover Frequency:

- While often expressed as a percentage, turnover frequency can also be measured as the number of employees leaving the company within a specific period (e.g., annually).
- This metric is a strong indicator of employee satisfaction and retention.

6. Performance Review Frequency:

- This measures how often performance reviews or evaluations are conducted for employees.

- Regular performance reviews help track employee progress, provide feedback, and identify areas for development.

7. Frequency of Employee Communication:

- This tracks how frequently employees are communicated with regarding company news, updates, and policies.
- Consistent and transparent communication can improve employee engagement and satisfaction.

Central tendency measure

The central tendency measure is defined as the number used to represent the center or middle of a set of data values. The three commonly used measures of central tendency are the mean, median, and mode. A statistic that tells us how the data values are dispersed or spread out is called the measure of dispersion.

Measures of central tendency, also known as averages, are values that represent the center of a dataset. The three main measures are the mean, median, and mode.

1. Mean (Arithmetic Average):

- The mean is calculated by summing all the values in a dataset and dividing by the number of values.
- It's the most common type of average and is used for numerical data.
- It's sensitive to outliers, meaning extreme values can significantly influence the mean.

2. Median:

- The median is the middle value in a sorted dataset.
- To find the median, arrange the data in ascending order and identify the middle value.
- If there is an even number of values, the median is the average of the two middle values.
- It's less sensitive to outliers than the mean.

3. Mode:

- The mode is the value that appears most frequently in a dataset.
- A dataset can have more than one mode (bimodal, trimodal, etc.).
- It's suitable for both numerical and categorical data.
- It's not affected by outliers and can be useful for identifying common values.

Other Measures of Central Tendency:

- **Midrange:** The average of the smallest and largest values in a dataset.
- **Geometric Mean:** Used for data those are multiplied or have exponential relationships.

Mean (Average)

- **Definition:** The sum of all values divided by the number of values.
- **Example:** For the data set {2, 4, 6, 8, 10}, the mean is (2+4+6+8+10)/5 = 6.
- **Application:** Useful when data is relatively evenly distributed and outliers don't significantly skew the average.

Median

- **Definition:**

The middle value when the data set is sorted in ascending or descending order. If there's an even number of values, the median is the average of the two middle values.

- **Example:**

For the data set {2, 4, 6, 8, 10}, the median is 6. For {2, 4, 6, 8}, the median is (4+6)/2 = 5.

- **Application:**

More robust than the mean when outliers are present, as it's not as affected by extreme values.

Mode

- **Definition:** The value that appears most often in the data set.
- **Example:** For the data set {2, 2, 4, 6, 8}, the mode is 2. For {2, 4, 6, 8, 8}, the mode is 8.
- **Application:** Useful for categorical data or situations where the most frequent value is important (e.g., identifying the most common size of clothing).

Measures of dispersion exercises can be found online at resources

It like Cuemath and Unacademy. These resources offer a variety of exercises, including examples with solutions on finding the range, coefficient of range, and standard deviation.

Example Exercise:

Question: Find the range and coefficient of range of the data set {8, 12, 5, 6, 8, 2, 15}.

Solution:

1. **Find the highest and lowest values:** The highest value (H) is 15, and the lowest value (S) is 2.
2. **Calculate the range:** Range = H - S = 15 - 2 = 13.
3. **Calculate the coefficient of range:** Coefficient of Range = (H - S) / (H + S) = 13 / (15 + 2) = 13/17 ≈ 0.76.

Therefore, the range is 13, and the coefficient of range is 0.76.

Additional Resources:

- GeeksforGeeks: Provides examples and explanations on finding the range of ungrouped data.
- Doubtnut: Offers solutions to very short answer type questions on measures of dispersion.
- Doubtnut: Provides solutions to practice exercises on measures of dispersion.
- Study.com: Offers quizzes and worksheets on measuring dispersion, including examples on standard deviation.

Measures of position

Measures of position help determine where a specific value sits within a dataset. Common examples include percentiles, quartiles, and deciles. These measures divide a dataset into equal parts, allowing for analysis of the relative standing of a particular value.

Here's a breakdown of measures of position and some example problems:

Key Concepts:

- **Percentiles:**
  Divide the data into 100 equal parts. The k-th percentile indicates the value below which k% of the data falls. For example, the 75th percentile means that 75% of the data values are less than or equal to that value.
- **Quartiles:**
  Divide the data into four equal parts. They are labeled Q1 (25th percentile), Q2 (50th percentile, or median), and Q3 (75th percentile).
- **Deciles:**
  Divide the data into 10 equal parts. The k-th decile indicates the value below which k*10% of the data falls.

Example Problems:

1. **1. Finding the 70th Percentile:**

- **Problem:** A student's scores on a math test are: 60, 65, 70, 72, 75, 78, 80, 82, 85, 90, 95. Find the 70th percentile.
- **Solution:**
- First, arrange the scores in ascending order (already done in this example).
- Use the formula: Position = (percentile / 100) * (number of data points + 1).
- Position = (70/100) * (11 + 1) = 8.4
- Since the position is not a whole number, round it up to 9 (8.4 rounds up to 9) and the value in the 9th position is 82.
- Therefore, the 70th percentile is 82.

2. Finding Quartiles:

- **Problem:** Calculate the first quartile (Q1), second quartile (Q2/median), and third quartile (Q3) of the following data: 10, 12, 15, 18, 20, 22, 25, 28, 30, 35.
- **Solution:**
- **Q2 (Median):** Since there are 10 data points, the median is the average of the 5th and 6th values: (20 + 22)/2 = 21.
- **Q1:** Find the median of the lower half of the data: 10, 12, 15, 18, 20. The median is 15.
- **Q3:** Find the median of the upper half of the data: 22, 25, 28, 30, 35. The median is 28.
- Therefore, Q1 = 15, Q2 = 21, and Q3 = 28.

3. Finding the 4th Decile:

- **Problem:** A dataset has 20 values. Find the 4th decile.
- **Solution:**
- Use the formula: Position = (decile number / 10) * (number of data points).
- Position = (4/10) * 20 = 8
- The 4th decile is the value at the 8th position in the sorted dataset.

Additional Notes:

- When calculating percentiles or quartiles, it's crucial to have the data sorted from smallest to largest.
- If the calculated position is not a whole number, use interpolation or rounding techniques to find the value.
- Measures of position are useful for understanding the distribution of data and comparing values within a dataset.

Here are some exercises related to skewness and kurtosis, along with their answers.

Exercises:

1. **1. Data Set:**

Consider the following data set: 1, 2, 3, 4, 5, 6, 7, 8, 9, 100.

- Calculate the mean, median, and mode.
- Calculate the coefficient of skewness (using the mean, median, and standard deviation).
- Analyze the skewness and kurtosis of the data set.

2. Frequency Distribution:

Calculate the skewness and kurtosis of a frequency distribution given the following data:

Value (x)	**Frequency (f)**
1	1
2	3
3	5
4	7
5	9
6	7
7	5
8	3

1. **Moment Measures:** Given a distribution with μ1 = 0, μ2 = 100, μ3 = 500, and μ4 = 30000, calculate the coefficient of skewness (γ1) and the coefficient of kurtosis (β2).

Answers and Explanations:

1. Data Set Analysis:

- **Mean:** (1 + 2 + ... + 100) / 10 = 50.5
- **Median:** The middle value is (6 + 7)/2 = 6.5
- **Mode:** There is no mode since all values appear only once, except 100.
- **Standard Deviation:** $s = \sqrt{((\sum(x_i - \mu)^2)/(n-1))} = 27.2$
- **Coefficient of Skewness:** (mean - median) / s = (50.5 - 6.5) / 27.2 = 1.56. This indicates a positive skew.
- **Kurtosis:** $(\mu4 / s^4) - 3 = (30000 / (27.2^4)) - 3 = 1.59$. This indicates the data has a relatively higher peak compared to a normal distribution, while the tails are not too heavy.

2. Frequency Distribution:

- **Mean:** (11 + 23 + 35 + 47 + 59 + 67 + 75 + 83 + 9*1) / 40 = 4.95
- **Mode:** 5
- **Standard Deviation:** s ≈ 2.0
- **Coefficient of Skewness:** (mean - mode) / s = (4.95 - 5) / 2.0 = -0.025. This suggests a slight negative skew.
- **Kurtosis:** $(\mu4 / s^4) - 3$. Since μ4 involves calculating the fourth moment, it's computationally more complex to do here by hand. You'd typically use statistical software for this calculation.

3. Moment Measures:

- **Coefficient of Skewness (γ1):** μ3 / μ2^(3/2) = 500 / 100^(3/2) = 500 / 1000 = 0.5
- **Coefficient of Kurtosis (β2):** $(\mu4 / \mu2^2) - 3 = (30000 / 100^2) - 3 = 3 - 3 = 0$. This indicates the distribution is mesokurtic (like a normal distribution).

Key Concepts:

- **Skewness:**
  Measures the asymmetry of a distribution. A positive skew means the tail extends more to the right (higher values), while a negative skew extends more to the left (lower values).
- **Kurtosis:**
  Measures the "tiredness" of a distribution. A higher kurtosis indicates heavier tails, meaning more extreme values are present.
- **Normal Distribution:**
  A symmetrical distribution with a specific shape (bell-shaped). Its skewness is 0 and kurtosis is 3 (mesokurtic).

Z-score exercises

Z-score exercises help understand how far a data point is from the mean in standard deviations, allowing for data comparison across different datasets. Here's a breakdown of how to calculate Z-scores and some practice problems with answers:

Understanding Z-Scores

- **Formula:**
  Z = (x - μ) / σ, where:
- Z is the Z-score
- x is the individual data point
- μ is the population mean
- σ is the population standard deviation

Interpretation:

- A positive Z-score means the data point is above the mean.
- A negative Z-score means the data point is below the mean.
- The magnitude of the Z-score indicates how many standard deviations the data point is from the mean.

Practice Problems with Answers

1. **1. Basic Z-score Calculation:**

- **Problem:** A student scores 85 on a test where the mean score is 75 and the standard deviation is 10. What is the student's Z-score?
- **Solution:** Z = (85 - 75) / 10 = 1.0

2. Z-score with a Negative Result:

- **Problem:** A person's height is 160 cm, and the average height in a population is 170 cm with a standard deviation of 15 cm. What is the person's Z-score?
- **Solution:** Z = (160 - 170) / 15 = -0.67

3. Percentage of Data Below a Certain Value:

- **Problem:** A machine produces parts with a mean length of 10 cm and a standard deviation of 1 cm. What percentage of parts will have a length less than 11 cm?
- **Solution:**

Calculate Z-score for 11 cm: Z = (11 - 10) / 1 = 1.0

Look up 1.0 in a Z-table or use a calculator to find the area to the left of Z = 1.0 (approximately 0.8413).

- This area represents the percentage, so 84.13% of parts will have a length less than 11 cm.

1. **4. Finding the Corresponding Value for a Z-score:**

- **Problem:** In a normal distribution with a mean of 50 and a standard deviation of 10, what value corresponds to a Z-score of -1.28?

- **Solution:** Using the formula Z = (x - μ) / σ, solve for x: -1.28 = (x - 50) / 10 => x = 37.2

2. **5. Z-score in a Dataset:**

- **Problem:** A dataset of exam scores is: 65, 70, 75, 80, 85. Calculate the Z-score for the score 75.
- **Solution:**

1. Calculate the mean of the dataset: (65 + 70 + 75 + 80 + 85) / 5 = 75.
2. Calculate the standard deviation of the dataset (using a calculator or software, the standard deviation is approximately 8.66).

- Calculate the Z-score: Z = (75 - 75) / 8.66 = 0.0

Cross-tabulation analysis, also known as contingency table analysis, is a method used to analyze the relationship between two or more categorical variables. In HR, it can be used to examine the relationship between employee demographics and satisfaction, engagement, or turnover. Here's an example and how it's used in HR:

Example Exercise:

An HR manager wants to understand if employee satisfaction levels differ based on their department and tenure. They conducted a satisfaction survey with the following questions:

- **Department:** (Marketing, Sales, Operations, IT)
- **Tenure:** (0-2 years, 2-5 years, 5+ years)
- **Satisfaction:** (Very Satisfied, Satisfied, Neutral, Dissatisfied, Very Dissatisfied)

Scenario:

A survey of 100 employees yielded the following data:

For example, consider your college application. You probably did not realize it then, but you were mentally cross-tabulating the factors involved to arrive at a conscious decision concerning the colleges you wanted to attend and had the best shot at while applying. Let us go through your decision-making process one factor at a time.

First, you needed to look at the academic factor: your grades throughout high school, SAT scores, the field you wanted to major in, and the application essay you would need to write. Second, comes the financial factor, which will look at the tuition fees and possibilities of a scholarship. Lastly, it would be the emotional factor which will consider your distance from home and how far are the universities your friends are considering, so reunions would not be an issue. In other words, cross-tabulating Academics + Finance + Emotions led you to a refined list of universities, one of which is or soon will be your Alma Mater.

Cross-tabulation, also known as cross-tab or contingency table, is a statistical tool used for categorical data. Categorical data involves values that are mutually exclusive to each other. Data is always collected in numbers, but numbers have no value unless they mean something. 4, 7, 9 are merely numerical unless specified—for example, 4 apples, 7 bananas, and 9 kiwis.

Researchers use cross-tabulation to examine the relationship within the data that is not readily evident. It is quite useful in market research studies and surveys. A cross-tab report shows the connection between two or more questions asked in the study.

Understanding cross-tabulation with example

Cross-tab is a popular choice for statistical data analysis. Since it is a reporting/ analyzing tool, it can be used with any data level: ordinal or nominal. It treats all data as nominal data (nominal data is not measured. It is categorized). For example, you can analyze the relation between two categorical variables like age and purchase of electronic gadgets.

There are two questions asked here:

- What is your age?
- What electronic gadget are you likely to buy in the next six months?

You can see the distinctive connection between age and the purchase of electronic gadgets in this example. It is not surprising but exciting to see the correlation between the two variables through the data collected.

In survey research, crosstab allows us to deep dive and analyze the prospective data, making it simpler to spot trends and opportunities without getting overwhelmed with all the data gathered from the responses.

Cross-tabulation and chi-square

Chi-square or Pearson's chi-square test is any statistical hypothesis which researchers use to determine whether there is a significant difference between expected frequencies and the observed frequencies in one or more categories.

An important consideration when cross-tabulating your study's findings are verifying whether the cross-tab representation is true or false. This is similar to the doubt we have after joining a university, questioning if this was indeed a good fit or not. To resolve the dilemma, crosstab is computed along with the Chi-square analysis, which helps identify if the variables of the study are independent or related to each other. If the two elements are independent, the tabulation is termed insignificant, and the study would be termed as a null hypothesis. Since the factors are not related to each other, the outcome of the study is unreliable. On the contrary, if there is a relation between the two elements that would confirm that the tabulation results are significant and can be relied on to make strategic decisions.

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Another important term that we will introduce here is the Null hypothesis. The null hypothesis assumes any difference or importance one can see in a data set is by chance. The opposite of the null hypothesis is called the alternative hypothesis.

Applying the chi-square to surveys is usually done with these question types:

- Demographics
- Likert scale questions
- Cities
- Product name
- Dates and number (when clubbed together)

For example, we need to find out if there is an association between the buyer behavior of purchasing electronic devices and the region where it is sold. The data will be entered like the one in the table below:

As mentioned earlier, the chi-square test helps you determine if two discrete variables are associated. If there is an association, one variable's distribution will differ depending on the second variable's value. But if the two variables are independent, the first variable's distribution will be similar for all values of the second variable.

Using cross-tabulation and chi-square, we derive the following inference:

Applying the chi-square calculation to the above values - Pearson's chi square= 0.803, P- Value= 0.05. So what does this mean? We need to pay attention to the p-value. Compare the p-value to your alpha-level which is commonly 0.05.

- If the p-value is less than or equal to the alpha-value, then the two variables are associated.
- If the p-value is greater than the alpha value, you conclude the variables are independent.

In this example, Pearson chi-square statistics is 0.803 (with a p-value 0.05). So with an alpha value of 0.05, we conclude that there is no correlation and is insignificant.
Cross-tabulation and chi-square

- One significant advantage of using cross-tabulation in a survey is, its simple to compute and extremely easy to understand. Even if the researcher does not have an in-depth knowledge of the concept, it is effortless to interpret the results.

- It eliminates confusion as raw data can sometimes be challenging to understand and interpret. Even if there are small data sets, you might get confused if the data is not arranged in an orderly manner. Cross-tabulation offers a simple way of correlating the variables that help minimize confusion related to data representation.

- One can derive numerous insights from cross-tabulation. As mentioned in the cross-tabulation examples in the section above, it is not easy to interpret raw data. Cross-tab maps out the correlation between variables, insights that otherwise may have been overlooked are clearly understood. It is straightforward to understand the insights from even a complicated form of statistics.

- It provides qualified or relative data on two or more variables across multiple features with ease.

- The most important advantage of using cross-tabulation for survey analysis is the ease of using any data, whether it is nominal, ordinal, interval, or ratio.
  Cross-tabulation using QuestionPro
  1. Login to your QuestionPro account and choose the survey you want to analyze.
  2. Under Analytics, you will find the option for "Analysis". Click on Cross- Tabulation under Analysis.

  3. Select you row question and the column question from the dropdown respectively.

  4. A cross-tab table will be generated along with Pearson's Chi-square analysis.

  5. Once you have generated the report, you can also download the report.

Data visualization

Data visualization plays a crucial role in descriptive analytics by translating raw data into easily understandable visual representations like charts and graphs. This allows for the identification of patterns, trends, and outliers in a dataset, making it easier to communicate complex information and support informed decision-making.

Here's how data visualization complements descriptive analytics:

- **Identifying Patterns and Trends:**
  Visualizations highlight patterns and trends that might be difficult to discern from raw data alone.
- **Communicating Insights:**
  Charts and graphs effectively convey insights to stakeholders, facilitating better understanding and collaboration.
- **Facilitating Decision-Making:**
  By presenting data in a clear and concise way, data visualization supports more informed decision-making based on past events and trends.
- **Enhancing Data Exploration:**
  Visualizations can be used to explore data and uncover new insights, often leading to the identification of anomalies or relationships.

Examples of data visualization techniques used in descriptive analytics:

- **Bar Charts:**
  Used to compare different categories of data, such as sales figures by region or product type.
- **Line Charts:**
  Show trends over time, such as website traffic or stock prices.
- **Pie Charts:**

  Illustrate the proportion of a whole, such as market share or customer demographics.
- **Scatter Plots:**
  Display the relationship between two variables, helping to identify correlations or clusters.
- **Histograms:**
  Visualize the distribution of a single variable, showing the frequency of different values.
- **Box Plots:**
  Provide a summary of the distribution of a variable, including median, quartiles, and outliers.
- **Heat maps:**
  Show the relationship between multiple variables, often used in market research or financial analysis.
- **Interactive Dashboards:**
  Combine multiple visualizations and allow users to explore data interactively

Tabular data and visual data

Tabular data and visual data represent information in different ways, each with its own strengths and weaknesses. Tabular data presents information in a structured format, typically rows and columns, like a spreadsheet. Visual data, on the other hand, uses charts, graphs, and other visual representations to display information.

Tabular Data:

- **Strengths:**
- **Precision and detail:** Ideal for presenting exact figures and granular information.
- **Easy manipulation and analysis:** Facilitates sorting, filtering, and calculations.
- **Suitable for large datasets:** Can accommodate a large volume of data without clutter.
- **Good for detailed comparisons:** Enables side-by-side comparisons of specific data points.

Weaknesses:

- **Can be overwhelming:** Large tables can be difficult to navigate and understand at a glance.
- **Less intuitive for trends and patterns:** Requires more effort to identify overall trends compared to visual representations.
- **May require specialized knowledge:** Understanding tabular data can require familiarity with the underlying structure and terminology.

Use Cases:

- **Financial reporting:** Presenting detailed financial statements.
- **Inventory management:** Tracking stock levels and other details.
- **Database systems:** Storing and retrieving structured data.

Visual Data:

- **Strengths:**
- **Easy to grasp trends and patterns:** Visual representations make it easier to spot relationships and insights.
- **More accessible for non-experts:** Can communicate complex information in a more understandable way.
- **Effective for communication:** Can be used to effectively convey information to a wider audience.
- **Supports data exploration:** Helps users identify potential correlations and outliers.

Weaknesses:

- **Can be misleading:** Visualizations can be manipulated to present a biased view of the data.
- **Less precise for detailed comparisons:** May not be suitable for comparing specific data points.
- **May not be suitable for all data types:** Some data types may be difficult to visualize effectively.

Use Cases:

- **Business analytics:** Presenting performance data, sales trends, and market analysis.
- **Scientific research:** Illustrating experimental results and findings.
- **Data storytelling:** Communicating complex information in an engaging and accessible way.

Choosing Between Tabular and Visual Data:

- Consider the purpose of the data representation: Is the goal to present precise data or to communicate overall trends?.
- Consider the audience: Are they experts or non-experts? Do they need detailed information or a high-level summary?.
- Consider the complexity of the data: Is it a large dataset or a small one? Is it simple or complex?.
- Consider the context: Are you presenting data for internal use or for external communication?.
- In many cases, a combination of tabular and visual data can be the most effective approach, leveraging the strengths of both formats.

Introduction to excel, HR data visualization using Excel.

Excel, a powerful spreadsheet program, provides intuitive tools for data analysis and visualization, making it a valuable asset for HR professionals. It allows for the creation of charts, graphs, and dashboards to present HR data in a visually engaging and easily understandable format, helping identify trends and make data-driven decisions.

What is Excel?

- Excel is a spreadsheet program that allows you to organize, analyze, and visualize data.
- It uses a grid of rows and columns to store data, and offers various features like formulas, functions, and charts for data manipulation and analysis.

Data Visualization in Excel

- Data visualization in Excel transforms raw data into charts, graphs, and other visual elements, making it easier to understand complex data.
- This involves using Excel's charting tools to create various visualizations, such as bar charts, pie charts, line graphs, scatter plots, and more.
- Excel's data formatting, sorting, and filtering features also help in preparing data for visualization.

HR Data Visualization with Excel

- HR professionals use Excel to analyze and visualize HR data, such as employee demographics, performance metrics, compensation data, and turnover rates.
- Examples of HR data visualizations in Excel include:
  - **Employee demographics by department:** A bar chart showing the distribution of employees across different departments.
  - **Performance ratings over time:** A line graph illustrating the trend of employee performance ratings.
  - **Compensation analysis:** A pie chart showing the distribution of employee salaries within different salary bands.

- **Turnover rate analysis:** A chart showing the number of employees leaving the company over a specific period.

- These visualizations help HR managers understand the workforce, identify areas for improvement, and make data-driven decisions.
  Benefits of Using Excel for HR Data Visualization
- **Easy-to-use:**
  Excel is a user-friendly tool that allows HR professionals to create visualizations without requiring extensive technical expertise.
- **Cost-effective:**
  Excel is a readily available and affordable option for data analysis and visualization.
- **Versatile:**
  Excel can be used to create a wide variety of charts, graphs, and dashboards to suit different HR reporting needs.
- **Data-driven decision-making:**
  HR data visualizations in Excel provide a clear picture of the workforce, enabling data-driven decisions for strategic planning and resource allocation.
  Tips for Creating Effective HR Data Visualizations in Excel
- **Select the right chart type:**
  Choose the appropriate chart type (e.g., bar chart, pie chart, line graph) based on the type of data and the message you want to convey.
- **Keep it simple:**
  Avoid cluttering your charts with too many elements. Focus on the key insights and make them easy to understand.
- **Use clear labels and titles:**
  Ensure that your charts have clear titles, axis labels, and legends to help viewers understand the data.
- **Consider colour and design:**
  Use colour and design elements effectively to enhance readability and visual appeal.
- **Use Excel's features:**
  Explore Excel's features like conditional formatting, data tables, and pivot tables to enhance your data visualizations.

Microsoft Excel is the market leader when it comes to data analysis, both in HR and other business functions. While it is no substitute for an HR Information System and does not offer the most advanced people analytics capabilities, it is the all-time favorite for quick analysis and data visualization.

Excel provides HR professionals with a dynamic, relatively easy-to-use analysis tool. This article showcases some lesser-known Excel tools and functions that will help you power up your HR data analysis capabilities.

Contents

HR data analysis process

This article goes through four common steps in any HR data analysis project.

1. Cleaning your data
2. Analyzing your data
3. Storytelling
4. Dashboarding

A subset of Kaggle's IBM HR Analytics Attrition dataset is used for the examples. If you want to put your own Excel skills to the test, the data is available to download.

Step 1: Data cleaning

Every HR data analysis project starts with data. Sometimes you receive data from a colleague or client. At other times you query the database yourself.

If you are lucky, the data is immediately ready for analysis, but more often than not, your data may be contaminated, contains duplicates, inconsistencies, or other errors. So, before you even start analyzing, you always want to check the quality and accuracy of your HR data.

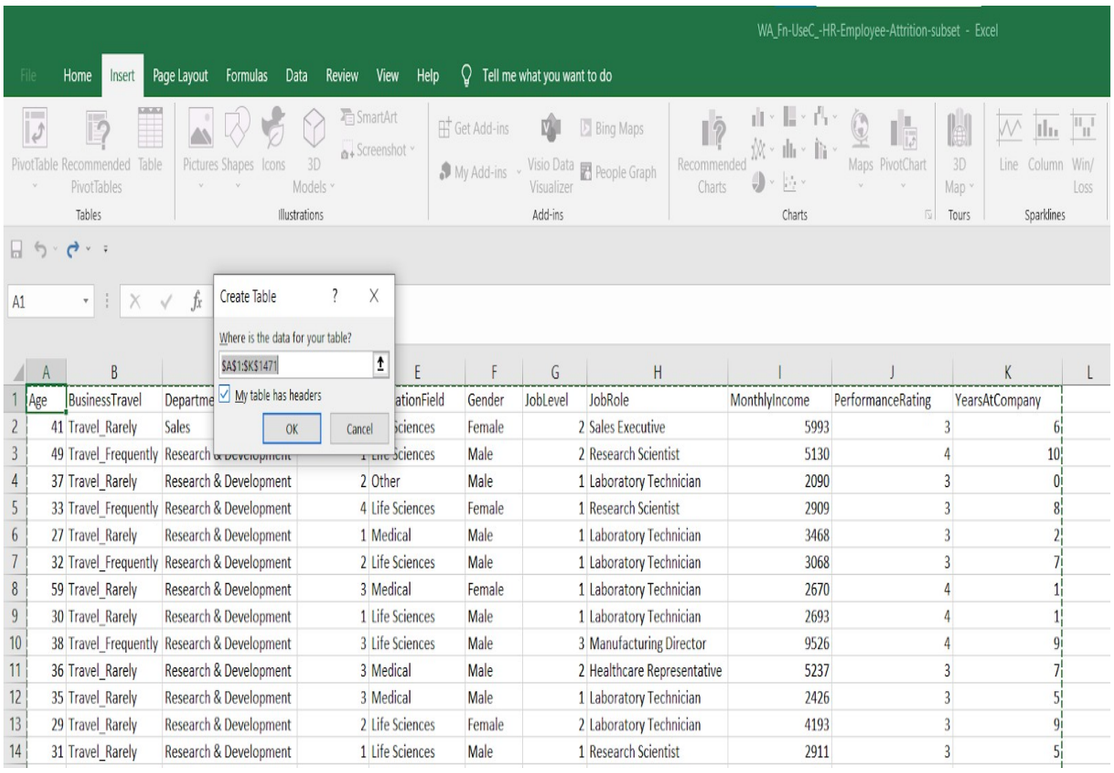
Data cleaning – also called data cleansing or data scrubbing – is often the most liposome phase of an HR data analysis project.

1. Excel Tables

You might be tempted to start working on your data from the moment you open Excel. However, this could mean missing out on utilizing the great functionality that Excel's built-in tables offer.

Excel Tables are handy containers for your data. They ensure that the values in a row stay together, which prevents you from accidentally scrambling the data when you sort and filter columns.

To make a table, click on any cell, then go to Insert > Table and select the range. Or use CTRL + T as a shortcut.



	A	B	C	D	E	F	G	H	I	J	K
1	Age	BusinessTravel	Departme		ationField	Gender	JobLevel	JobRole	MonthlyIncome	PerformanceRating	YearsAtCompany
2	41	Travel_Rarely	Sales		Sciences	Female	2	Sales Executive	5993	3	6
3	49	Travel_Frequently	Research & Development	1	Life Sciences	Male	2	Research Scientist	5130	4	10
4	37	Travel_Rarely	Research & Development	2	Other	Male	1	Laboratory Technician	2090	3	0
5	33	Travel_Frequently	Research & Development	4	Life Sciences	Female	1	Research Scientist	2909	3	8
6	27	Travel_Rarely	Research & Development	1	Medical	Male	1	Laboratory Technician	3468	3	2
7	32	Travel_Frequently	Research & Development	2	Life Sciences	Male	1	Laboratory Technician	3068	3	7
8	59	Travel_Rarely	Research & Development	3	Medical	Female	1	Laboratory Technician	2670	4	1
9	30	Travel_Rarely	Research & Development	1	Life Sciences	Male	1	Laboratory Technician	2693	4	1
10	38	Travel_Frequently	Research & Development	3	Life Sciences	Male	3	Manufacturing Director	9526	4	9
11	36	Travel_Rarely	Research & Development	3	Medical	Male	2	Healthcare Representative	5237	3	7
12	35	Travel_Rarely	Research & Development	3	Medical	Male	1	Laboratory Technician	2426	3	5
13	29	Travel_Rarely	Research & Development	2	Life Sciences	Female	2	Laboratory Technician	4193	3	9
14	31	Travel_Rarely	Research & Development	1	Life Sciences	Male	1	Research Scientist	2911	3	5

Excel adds out-of-the-box formatting to its tables, as well as advanced filtering and slicing functionality.

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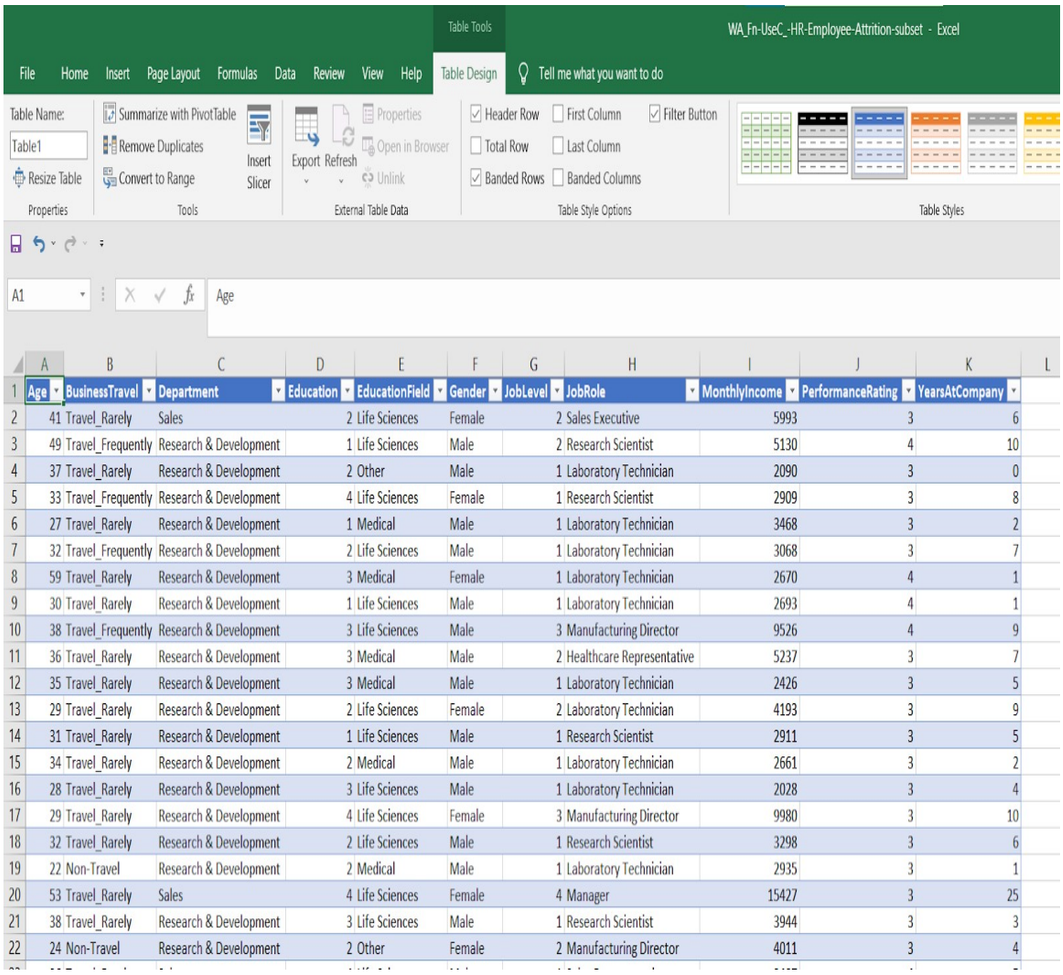


Age	BusinessTravel	Department	Education	EducationField	Gender	JobLevel	JobRole	MonthlyIncome	PerformanceRating	YearsAtCompany
41	Travel_Rarely	Sales	2	Life Sciences	Female	2	Sales Executive	5993	3	6
49	Travel_Frequently	Research & Development	1	Life Sciences	Male	2	Research Scientist	5130	4	10
37	Travel_Rarely	Research & Development	2	Other	Male	1	Laboratory Technician	2090	3	0
33	Travel_Frequently	Research & Development	4	Life Sciences	Female	1	Research Scientist	2909	3	8
27	Travel_Rarely	Research & Development	1	Medical	Male	1	Laboratory Technician	3468	3	2
32	Travel_Frequently	Research & Development	2	Life Sciences	Male	1	Laboratory Technician	3068	3	7
59	Travel_Rarely	Research & Development	3	Medical	Female	1	Laboratory Technician	2670	4	1
30	Travel_Rarely	Research & Development	1	Life Sciences	Male	1	Laboratory Technician	2693	4	1
38	Travel_Frequently	Research & Development	3	Life Sciences	Male	3	Manufacturing Director	9526	4	9
36	Travel_Rarely	Research & Development	3	Medical	Male	2	Healthcare Representative	5237	3	7
35	Travel_Rarely	Research & Development	3	Medical	Male	1	Laboratory Technician	2426	3	5
29	Travel_Rarely	Research & Development	2	Life Sciences	Female	2	Laboratory Technician	4193	3	9
31	Travel_Rarely	Research & Development	1	Life Sciences	Male	1	Research Scientist	2911	3	5
34	Travel_Rarely	Research & Development	2	Medical	Male	1	Laboratory Technician	2661	3	2
28	Travel_Rarely	Research & Development	3	Life Sciences	Male	1	Laboratory Technician	2028	3	4
29	Travel_Rarely	Research & Development	4	Life Sciences	Female	3	Manufacturing Director	9980	3	10
32	Travel_Rarely	Research & Development	2	Life Sciences	Male	1	Research Scientist	3298	3	6
22	Non-Travel	Research & Development	2	Medical	Male	1	Laboratory Technician	2935	3	1
53	Travel_Rarely	Sales	4	Life Sciences	Female	4	Manager	15427	3	25
38	Travel_Rarely	Research & Development	3	Life Sciences	Male	1	Research Scientist	3944	3	3
24	Non-Travel	Research & Development	2	Other	Female	2	Manufacturing Director	4011	3	4

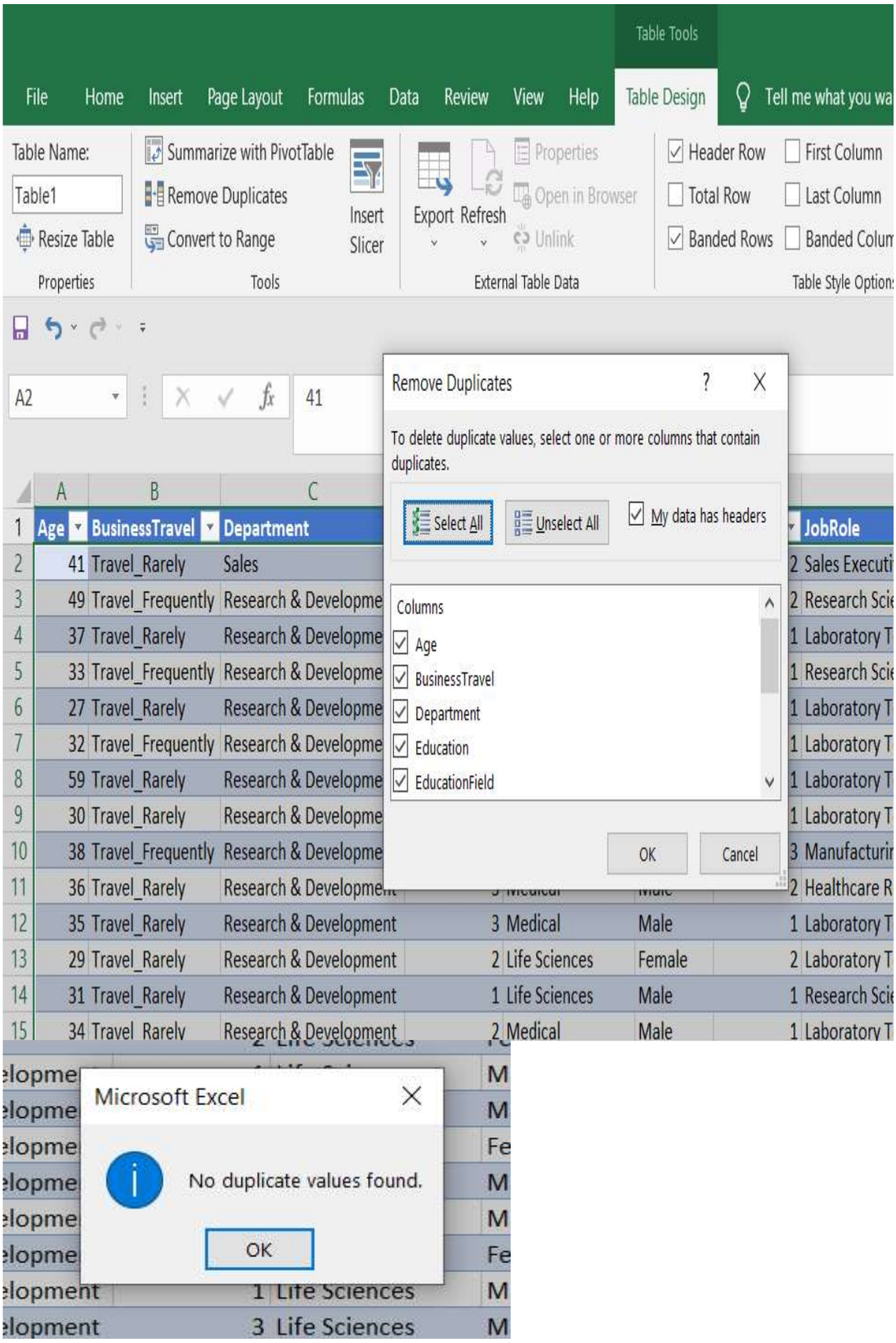
Your work will become much more organized when you use Excel Tables for your analyses.

2. Remove duplicates

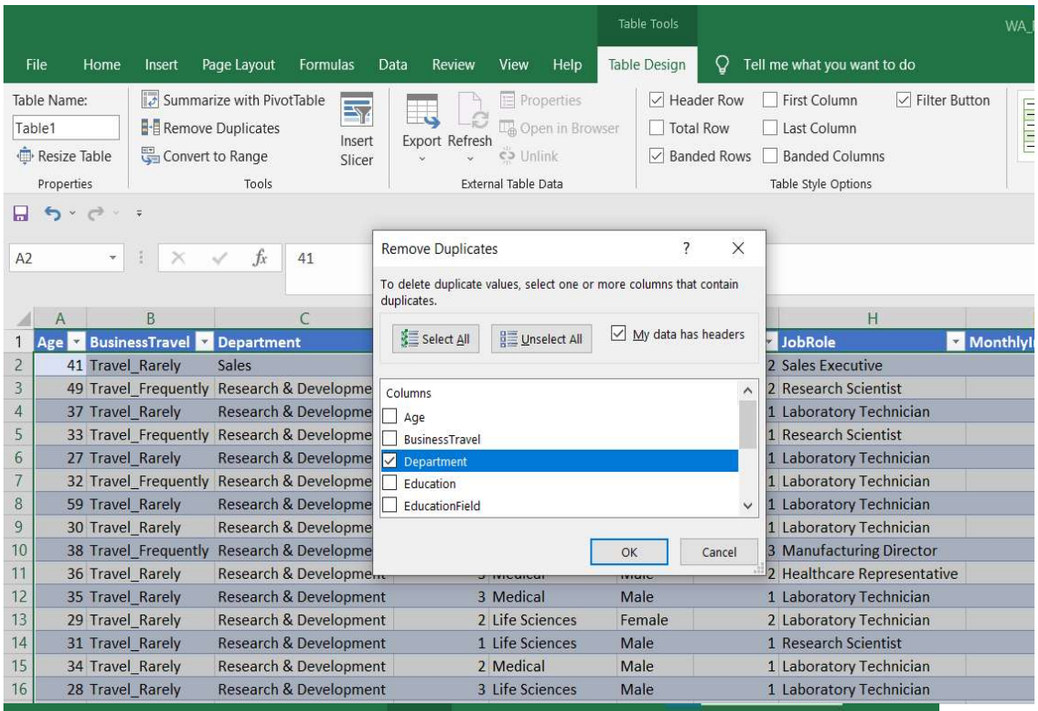
At times, your data tables may contain duplicate information. Maybe a specific employee appears twice in your database due to an administration error. Or, an employee has a dual contract, and therefore two records exist.

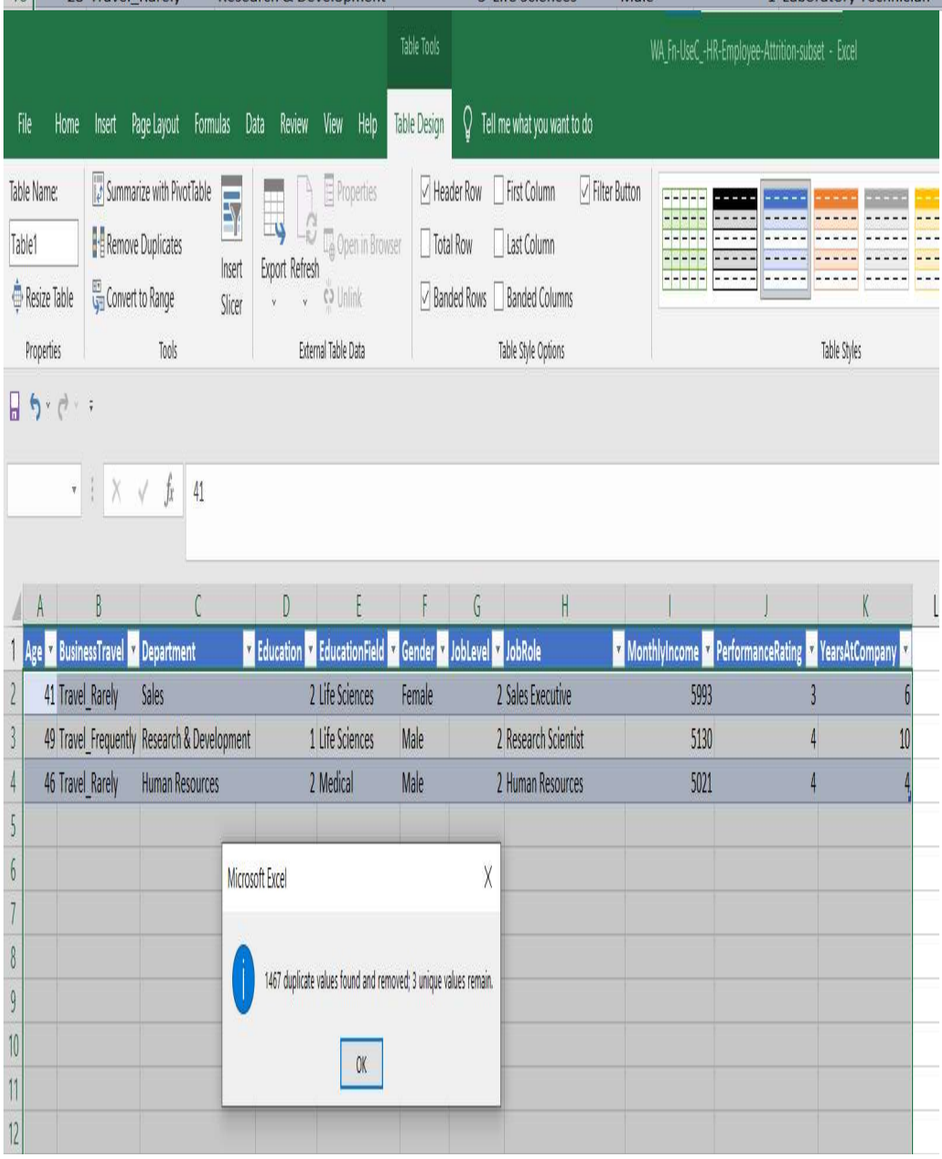
If you are working with Excel Tables, the Table Design tab contains a ‘Remove Duplicates’ button. It removes any rows that contain duplicate values on the selected columns.

Fortunately, there are no duplicate rows in our dataset.



However, if you were to select the ‘Department’ column only, Excel will remove all duplicates (such as Research and Development) and retain only the first rows in which it finds unique values.

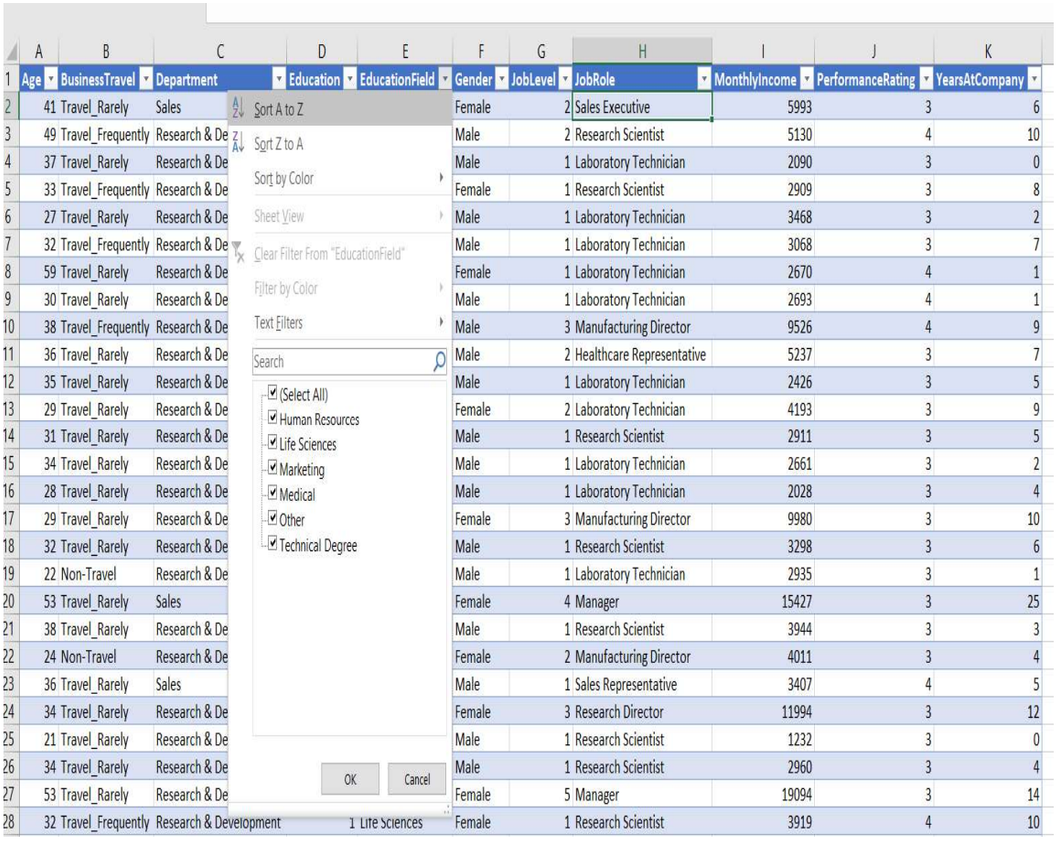




3. Sorting

Sorting is one of the most common tools of data management. You can sort your table by one or more columns in Excel, in ascending or descending order, or create a custom sort.

In Excel Tables, each column has a sortable filter included in its header.



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33	Travel_Frequently	Research & De			Female	1	Research Scientist	2909	3	8
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36	Travel_Rarely	Research & De			Male	2	Healthcare Representative	5237	3	7
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29	Travel_Rarely	Research & De			Female	2	Laboratory Technician	4193	3	9
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34	Travel_Rarely	Research & De			Male	1	Laboratory Technician	2661	3	2
28	Travel_Rarely	Research & De			Male	1	Laboratory Technician	2028	3	4
29	Travel_Rarely	Research & De			Female	3	Manufacturing Director	9980	3	10
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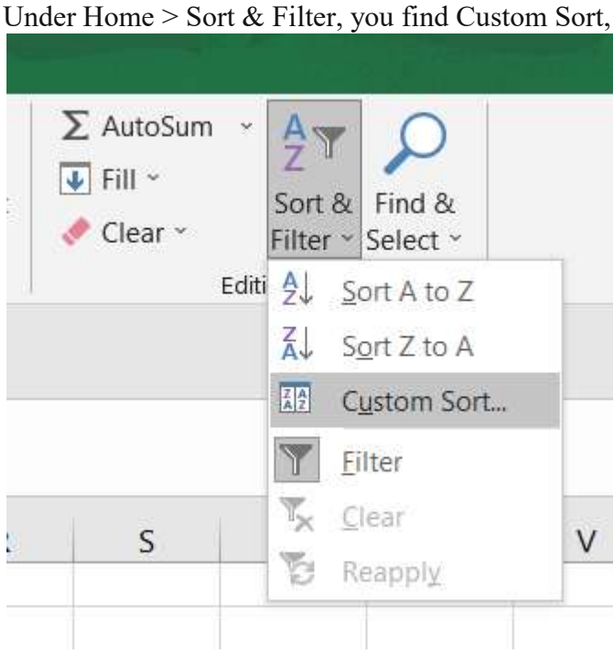
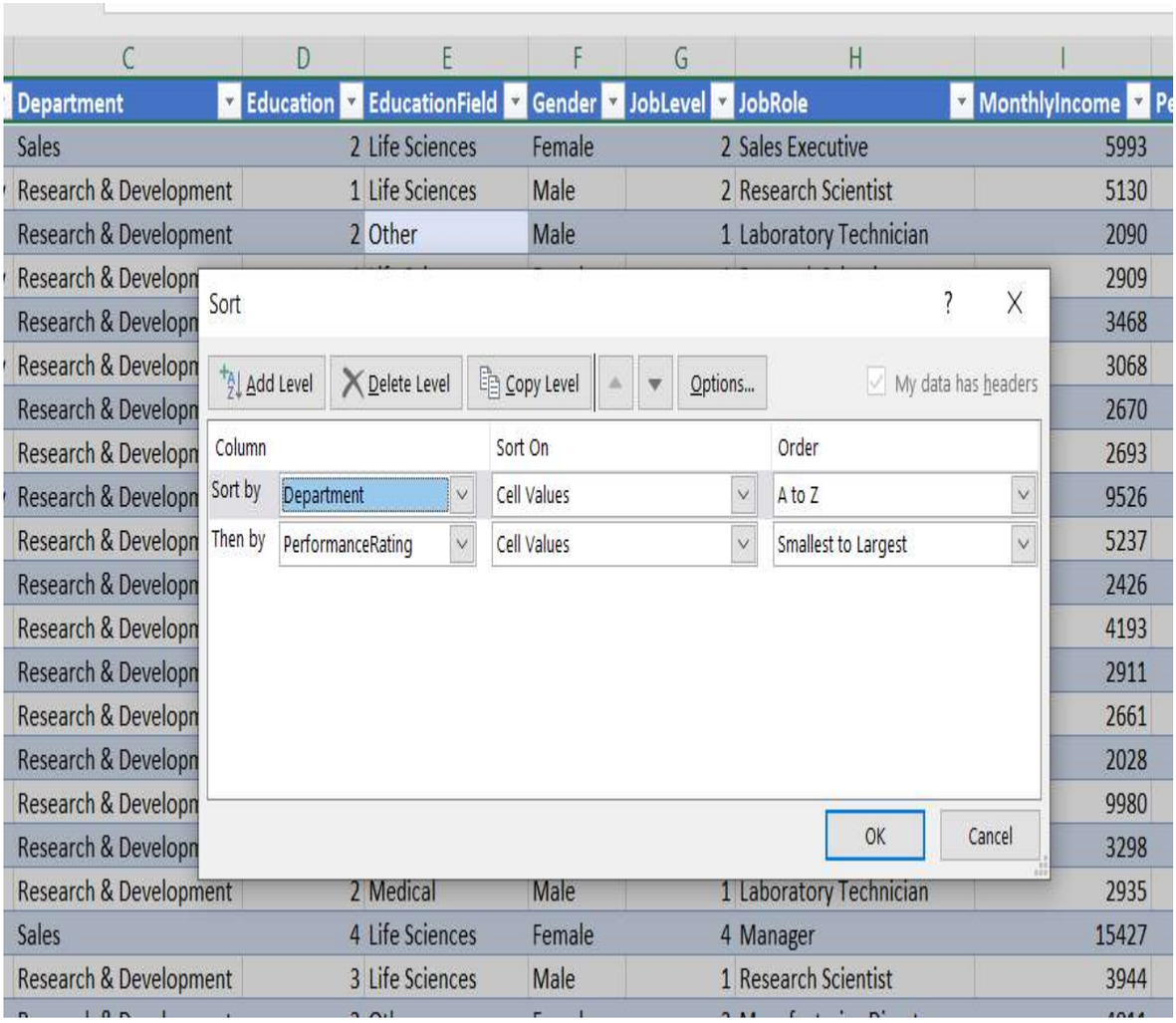
53	Travel_Rarely	Sales			Female	4	Manager	15427	3	25
38	Travel_Rarely	Research & De			Male	1	Research Scientist	3944	3	3
24	Non-Travel	Research & De			Female	2	Manufacturing Director	4011	3	4
36	Travel_Rarely	Sales			Male	1	Sales Representative	3407	4	5
34	Travel_Rarely	Research & De			Female	3	Research Director	11994	3	12
21	Travel_Rarely	Research & De			Male	1	Research Scientist	1232	3	0
34	Travel_Rarely	Research & De			Male	1	Research Scientist	2960	3	4
53	Travel_Rarely	Research & De			Female	5	Manager	19094	3	14
32	Travel_Frequently	Research & Development	1	Life Sciences	Female	1	Research Scientist	3919	4	10

Under Home > Sort & Filter, you find Custom Sort, allowing more advanced, multi-column sorting.





C	D	E	F	G	H	I
Department	Education	EducationField	Gender	JobLevel	JobRole	MonthlyIncome
Sales	2	Life Sciences	Female	2	Sales Executive	5993
Research & Development	1	Life Sciences	Male	2	Research Scientist	5130
Research & Development	2	Other	Male	1	Laboratory Technician	2090
Research & Developn						2909
Research & Developn						3468
Research & Developn						3068
Research & Developn						2670
Research & Developn						2693
Research & Developn						9526
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Research & Developn						4193
Research & Developn						2911
Research & Developn						2661
Research & Developn						2028
Research & Developn						9980
Research & Developn						3298
Research & Development	2	Medical	Male	1	Laboratory Technician	2935
Sales	4	Life Sciences	Female	4	Manager	15427
Research & Development	3	Life Sciences	Male	1	Research Scientist	3944

4. Converting data

Sometimes, numeric data is accidentally imported as text in Excel. This causes problems in your analysis, as Excel sorts text data differently.

Also, many advanced analyses, like correlation analysis, require that you provide numerical data. There are several handy functions to switch between data types in Excel:

VALUE

The VALUE function helps convert numbers stored as text to actual numeric data. Note that Excel, by default, aligns text strings to the left. Numeric data is default right-aligned. This gives you a visual cue as to how Excel interprets your data.

TEXT

The TEXT function helps turn numeric data into text strings in a specific number format. This neat overview shows the many ways in which you can format text numbers in Excel.

Original text	-2,4	**=VALUE(I3)**	-2,4
Original number	2,4	**=TEXT(I5;"$#,##.00")**	$2,400

FIXED

The FIXED function also returns numeric data as text, giving full control over formatting options like thousand separators and decimals.

Data	Formula Used	Result	Remarks
5129.631	=FIXED(5129.631)	5,129.63	Decimal argument is omitted so the default value of 2 is used.
529.631	=FIXED(529.631,1)	529.6	As the decimal argument is 1, we get the result with 1 decimal point.
5123.591	=FIXED(5123.591,-1)	5120	If decimals are negative, the number is rounded to the left of the decimal point.
5123.591	=FIXED(5123.591, -3, TRUE)	5000	

DOLLAR

Finally, the DOLLAR function converts numbers to text and applies currency formatting.

	A	B	C	D
1	Data	Formula	Result	Description
2	1234.567	=DOLLAR(A2,2)	$1,234.57	Displays the first number in a currency format, 2 digits to the right of the decimal point.
3	-1234.567	=DOLLAR(A3,-2)	($1,200)	Displays the second number in a currency format, 2 digits to the left of the decimal point.
4	-0.123	=DOLLAR(A4,4)	($0.1230)	Displays the third number in a currency format, 4 digits to the right of the decimal point.
5	99.888	=DOLLAR(A5)	$99.89	Displays the fourth number in a currency format, 2 digits to the right of the decimal point .

Source

5. Text manipulation

Excel provides many functions that help with “manipulating” text data.

PROPER

UPPER and LOWER help you set the case of your text strings. But have you heard of the PROPER function?

It capitalizes the first letter in a text string and any other letters in the text that follow any character other than a letter (also known as title case). All other letters are converted to lowercase letters.

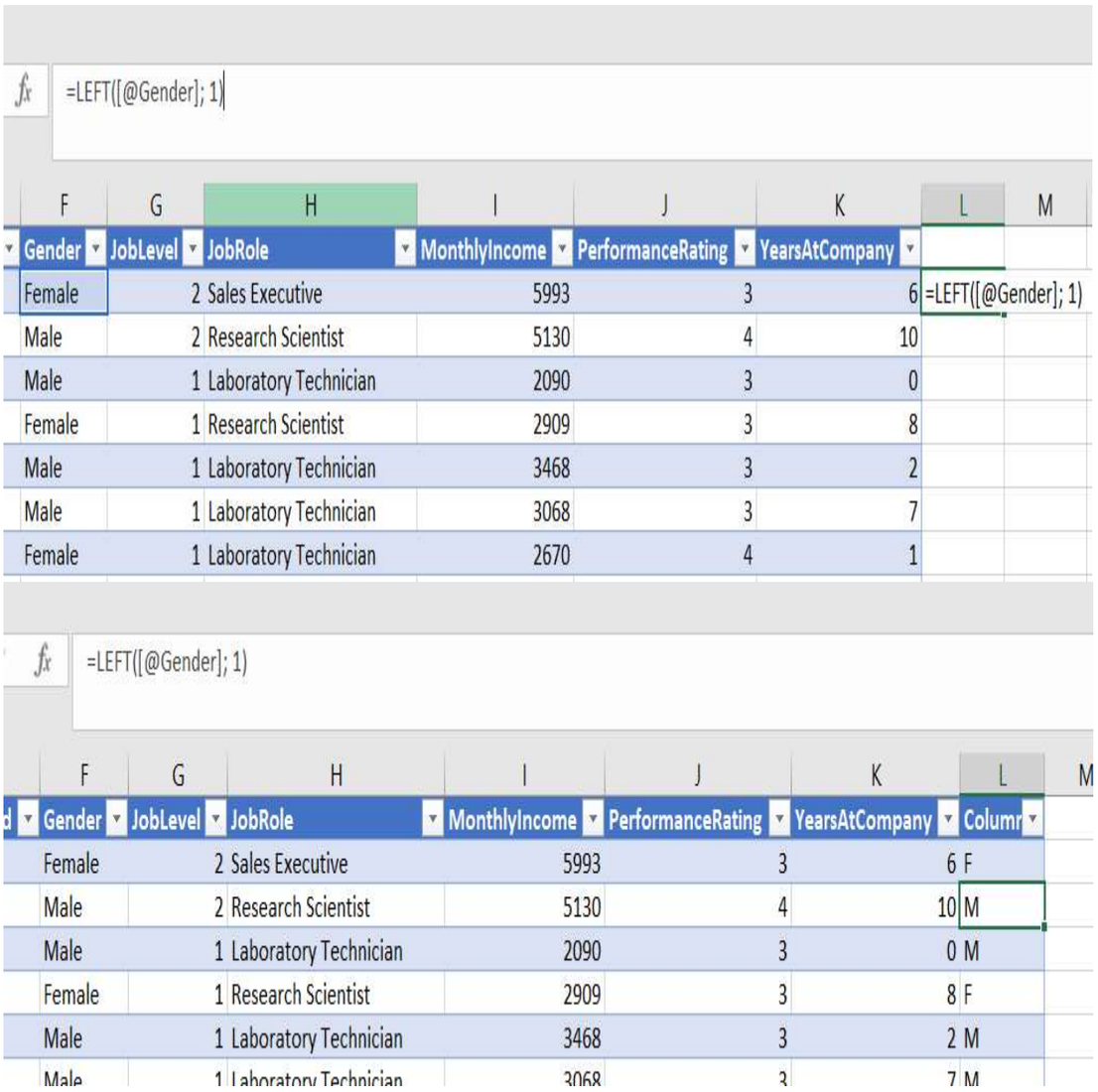
Original	Academy to Innovate HR
=UPPER(E3)	ACADEMY TO INNOVATE HR
=LOWER(E3)	academy to innovate hr
=PROPER(E3)	Academy To Innovate Hr

LEFT & RIGHT

Sometimes you only need part of a text string, such as the first couple of characters or the last ones.

In those cases, you can use LEFT and RIGHT, which respectively allows you to extract any number of characters from the start (LEFT) or end (RIGHT) of a text string.

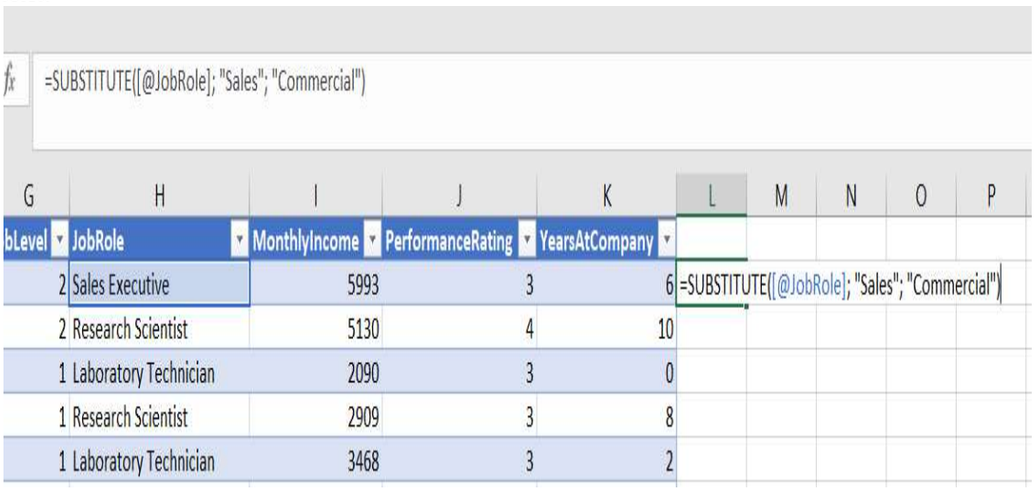
For instance, maybe you don’t want to use the full gender labels but only the first letter.



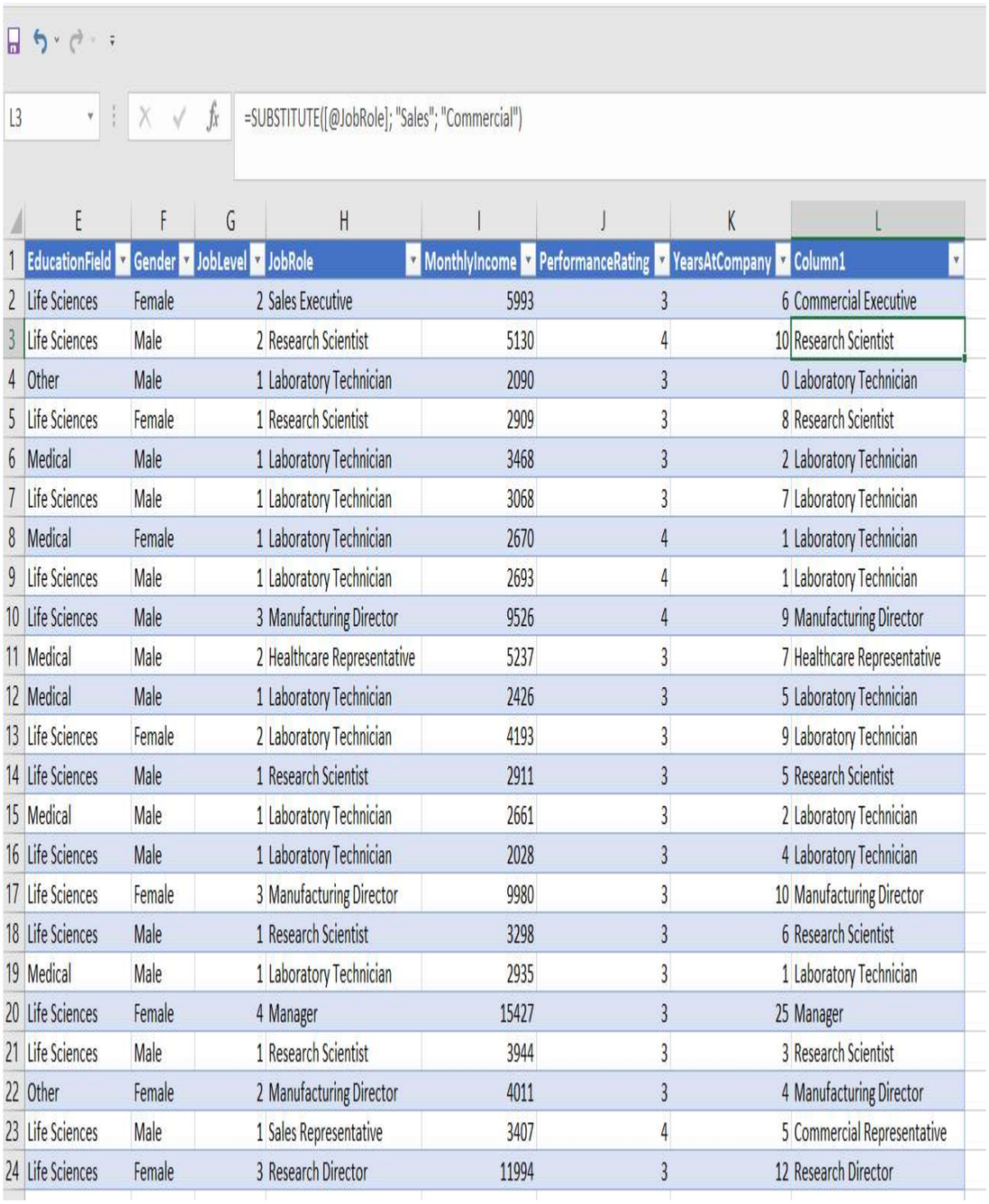
SUBSTITUTE

Sometimes you want to replace specific parts of a text. For instance, you might want to rename the “Sales” department to the “Commercial” department.

In Excel, you can use the SUBSTITUTE function to replace specific parts of a text string with an alternative text.



As you can see, this also changed the Job Role for the “Sales representative” on row 23.



	E	F	G	H	I	J	K	L
1	EducationField	Gender	JobLevel	JobRole	MonthlyIncome	PerformanceRating	YearsAtCompany	Column1
2	Life Sciences	Female	2	Sales Executive	5993	3	6	Commercial Executive
3	Life Sciences	Male	2	Research Scientist	5130	4	10	Research Scientist
4	Other	Male	1	Laboratory Technician	2090	3	0	Laboratory Technician
5	Life Sciences	Female	1	Research Scientist	2909	3	8	Research Scientist
6	Medical	Male	1	Laboratory Technician	3468	3	2	Laboratory Technician
7	Life Sciences	Male	1	Laboratory Technician	3068	3	7	Laboratory Technician
8	Medical	Female	1	Laboratory Technician	2670	4	1	Laboratory Technician
9	Life Sciences	Male	1	Laboratory Technician	2693	4	1	Laboratory Technician
10	Life Sciences	Male	3	Manufacturing Director	9526	4	9	Manufacturing Director
11	Medical	Male	2	Healthcare Representative	5237	3	7	Healthcare Representative
12	Medical	Male	1	Laboratory Technician	2426	3	5	Laboratory Technician
13	Life Sciences	Female	2	Laboratory Technician	4193	3	9	Laboratory Technician
14	Life Sciences	Male	1	Research Scientist	2911	3	5	Research Scientist
15	Medical	Male	1	Laboratory Technician	2661	3	2	Laboratory Technician
16	Life Sciences	Male	1	Laboratory Technician	2028	3	4	Laboratory Technician
17	Life Sciences	Female	3	Manufacturing Director	9980	3	10	Manufacturing Director
18	Life Sciences	Male	1	Research Scientist	3298	3	6	Research Scientist
19	Medical	Male	1	Laboratory Technician	2935	3	1	Laboratory Technician
20	Life Sciences	Female	4	Manager	15427	3	25	Manager
21	Life Sciences	Male	1	Research Scientist	3944	3	3	Research Scientist
22	Other	Female	2	Manufacturing Director	4011	3	4	Manufacturing Director
23	Life Sciences	Male	1	Sales Representative	3407	4	5	Commercial Representative
24	Life Sciences	Female	3	Research Director	11994	3	12	Research Director

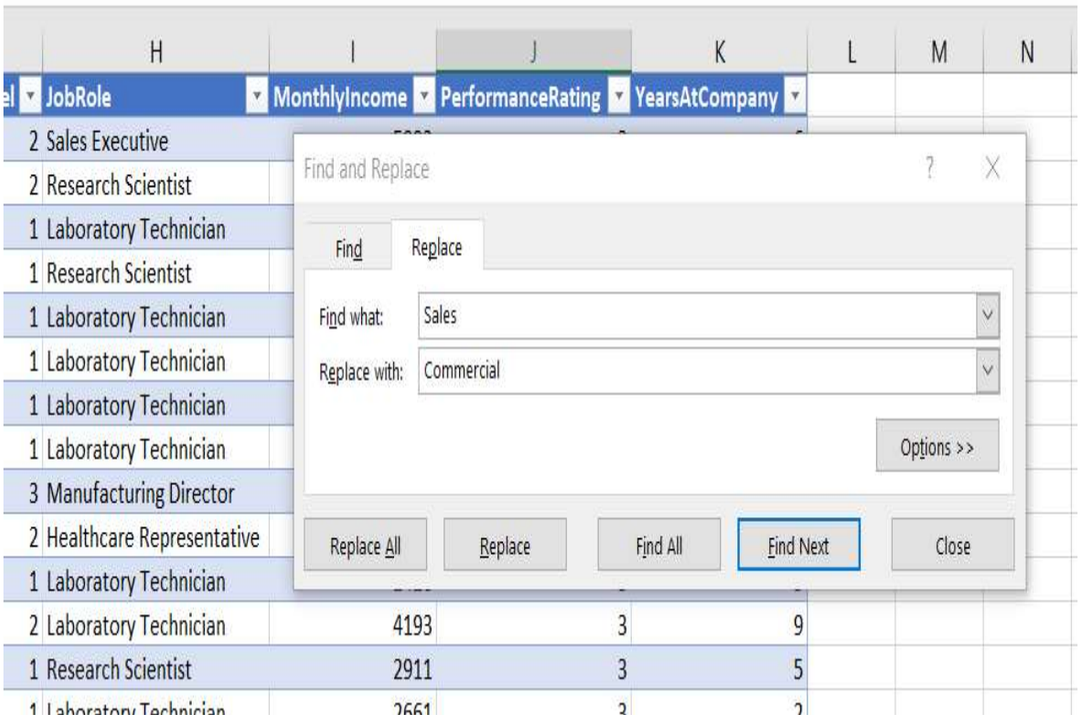
6. Find and Replace

You might encounter situations where you need to find and/or replace data values in your workbook. For instance, you might be looking for a specific employee, department, or job role.

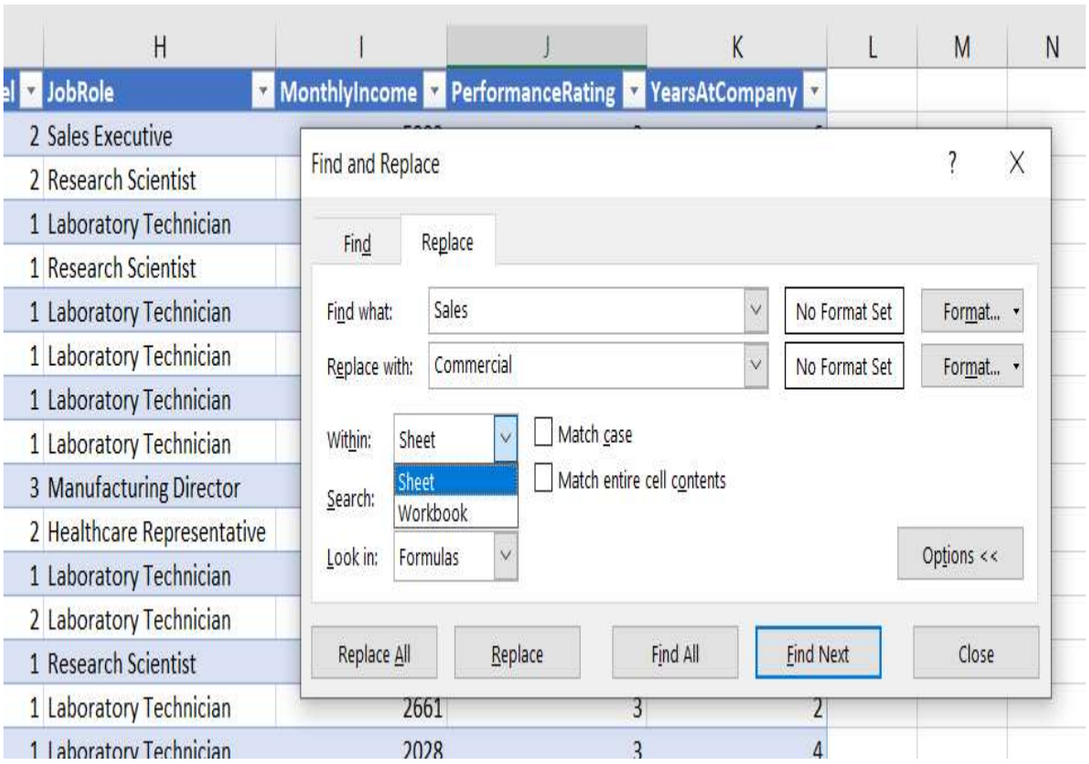
You can use the shortcut CTRL + F to open up the FIND menu. This allows you to input the data value you are looking for, and Excel will show you all occurrences of it in your worksheet.

If you press CTRL + H, this opens the FIND & REPLACE menu.

This allows you to not only locate the occurrences of data values but also enables you to replace them with another value. You could try to rename the ‘Sales’ department with this approach as well.



If you open the advanced options, you can even replace all occurrences of a value across your entire workbook.

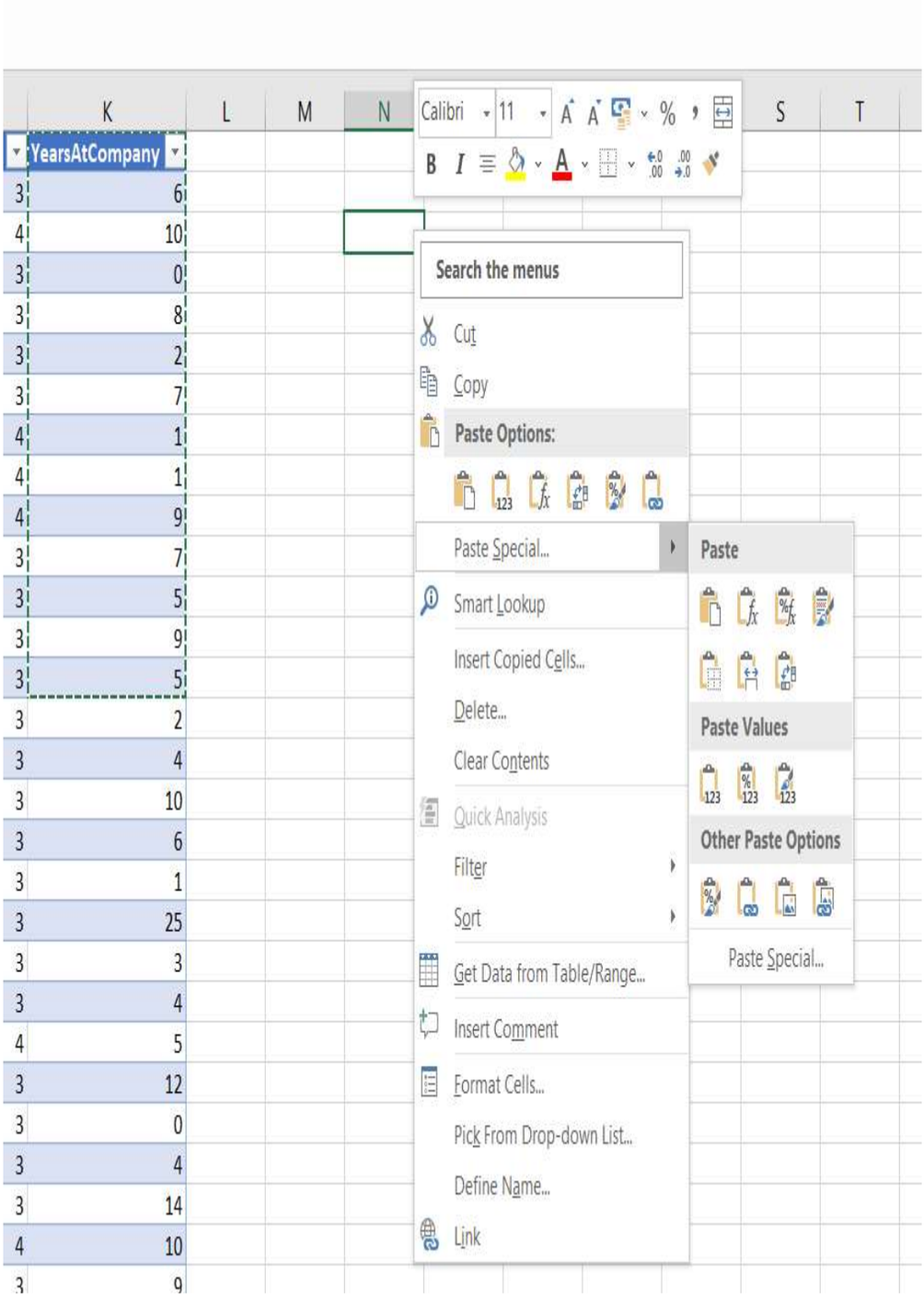


7. Paste special

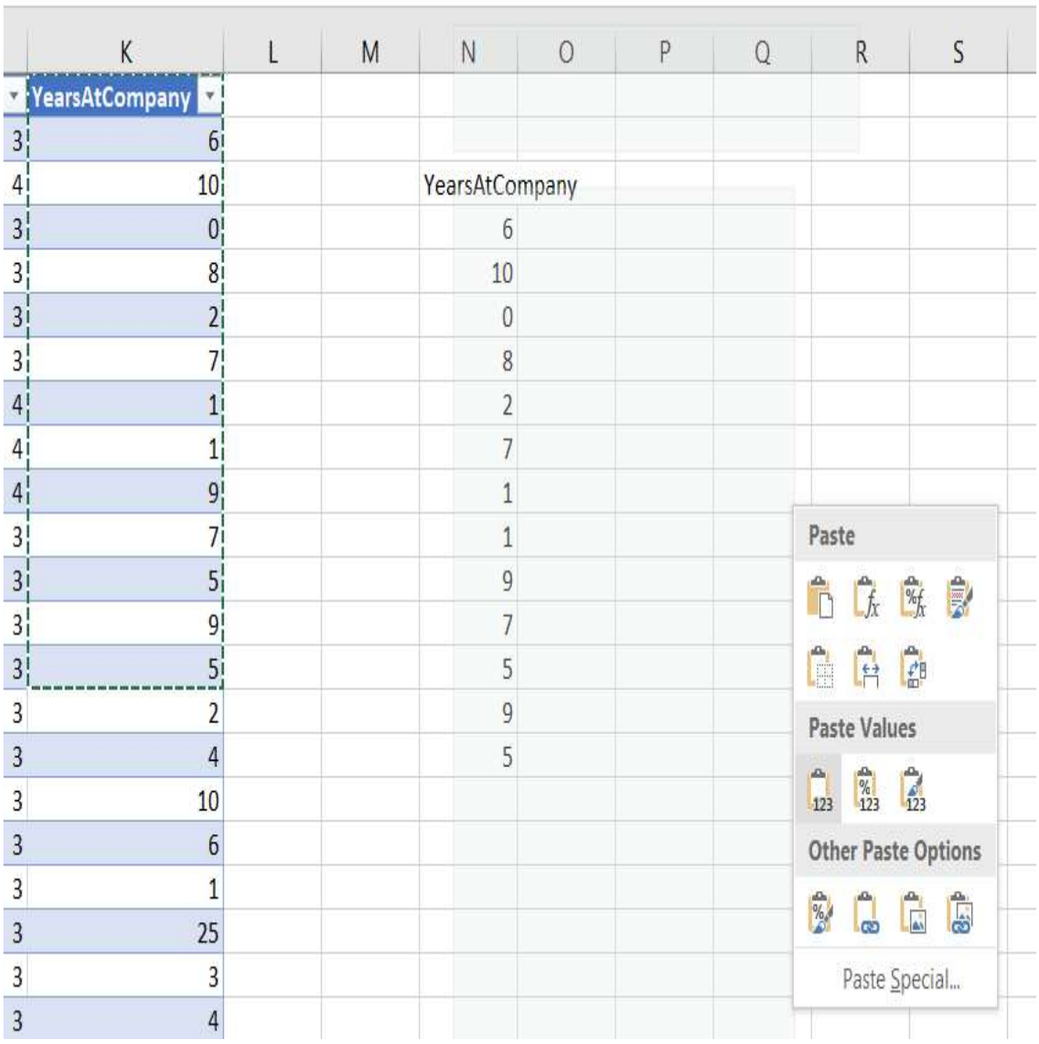
Another great feature of Excel is the Paste Special functionality.

Data values in Excel are often formatted in an explicit way — think of typeface, color, or font size. When copying and pasting values, sometimes you want to retain this formatting. At other times, you want to keep only the raw data. And again, in another situation, you might only want the formatting.

However, you can use Paste Special to instruct Excel to do exactly what you want with the copied data and its formatting. You will find the functionality when you click the right mouse button after you've copied any data.



For instance, you only want to keep the raw data:



Another handy trick is to paste the data transposed, which converts the rows into columns and vice versa:

Did you know you can even paste the raw results with any formulas you have copied? Or you can copy your selection as an image, including the formatting. This great functionality is handy when you want to add an Excel Table to an email or a presentation.

Step 2: Data analysis

Once you have cleaned your data and are confident in its quality, you are ready to start analyzing your data.

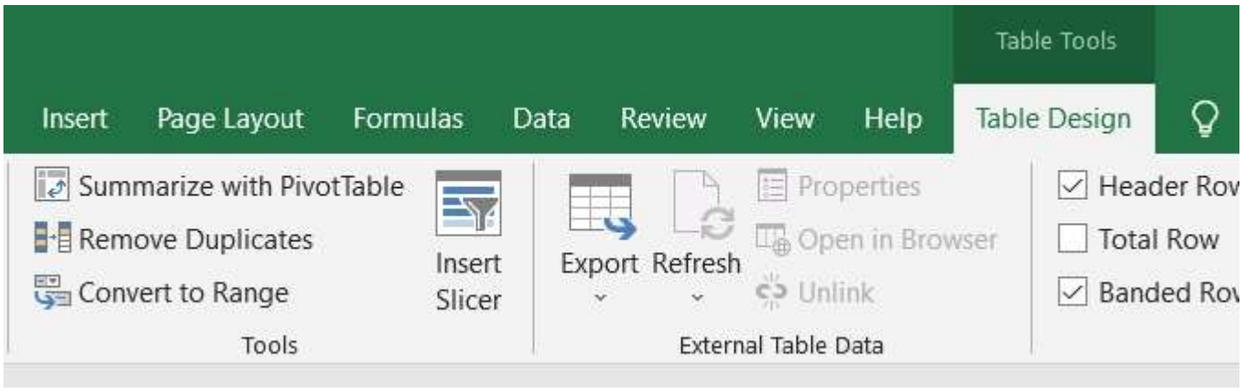
First, you might want to calculate descriptive analytics that summarizes your data to assist in uncovering insightful patterns. These insights can help to make important decisions on how to improve your HR processes and policies as well as evaluate their business impact.

Excel offers a lot of functions for data analysis. PivotTables are one such function that can really take your data analysis capabilities to the next level. If you want to find out more about how to use PivotTables, AIHR has provided step-by-step instructions on how to work with PivotTables.

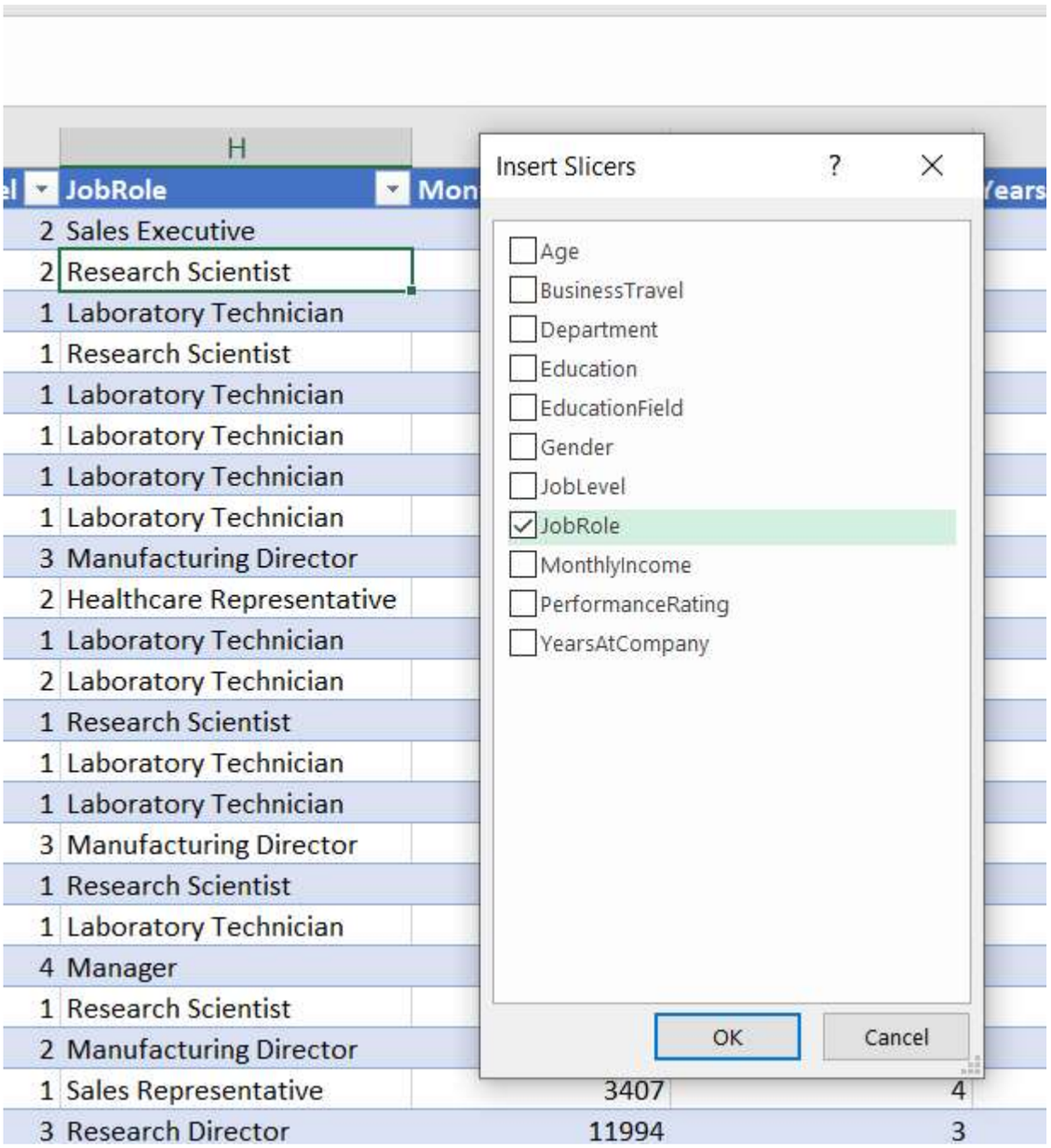
Below, let's unpack some additional tools and functions you can use in Excel and pivot tables to help you with your data analysis:

1. Slicers and Filters

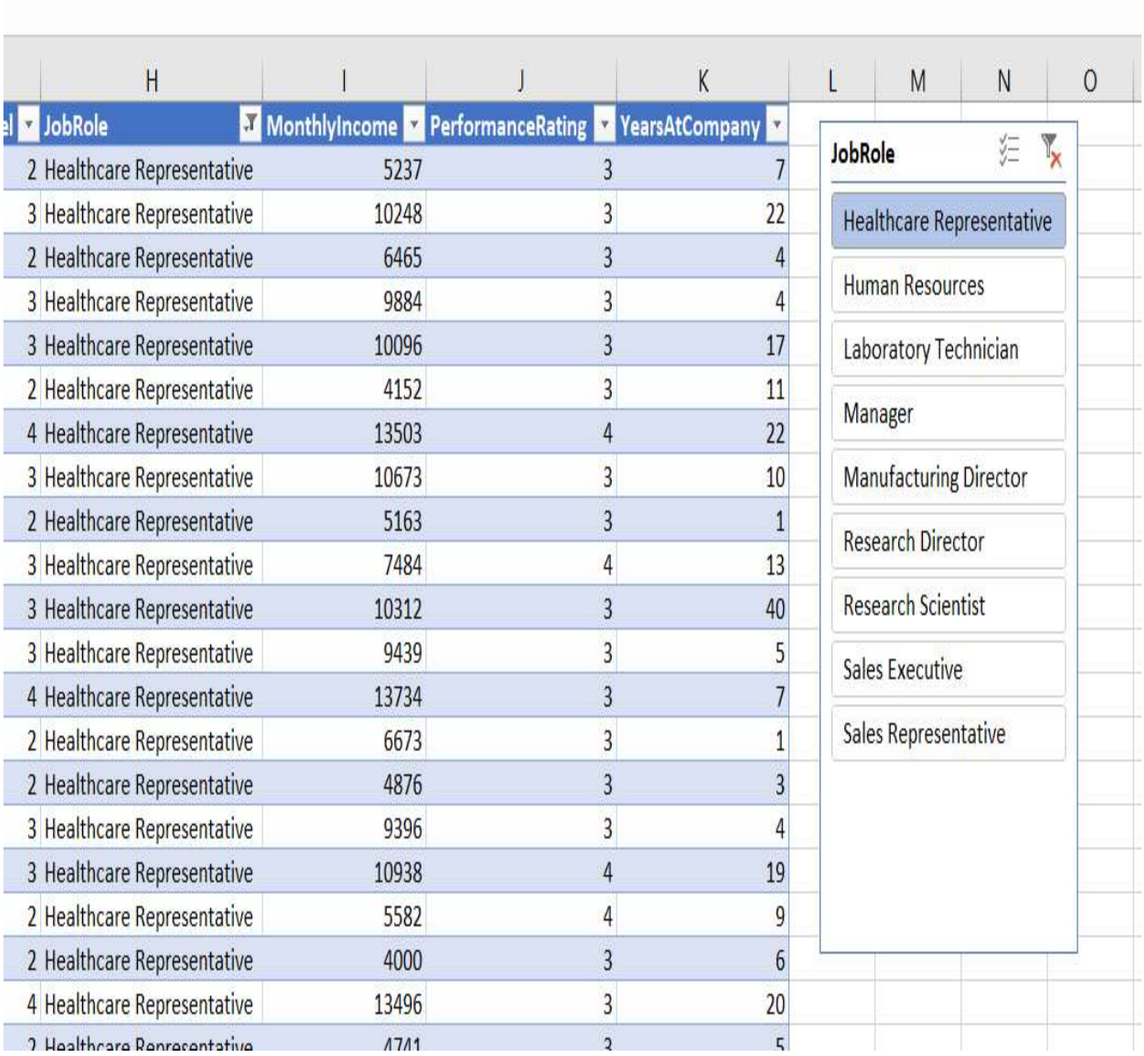
Slicers are clickable buttons that filter your Excel PivotTables. You can add a slicer by selecting any cell in a table, then going to Table Design > Insert Slicer.



Excel will prompt you to select one or more columns that you would like to create a slicer for. Let's select 'Job Role'.



The created slicer will provide a visual tool to quickly slice and filter your data table.



	H	I	J	K	L	M	N	O
el	JobRole	MonthlyIncome	PerformanceRating	YearsAtCompany				
2	Healthcare Representative	5237	3	7				
3	Healthcare Representative	10248	3	22				
2	Healthcare Representative	6465	3	4				
3	Healthcare Representative	9884	3	4				
3	Healthcare Representative	10096	3	17				
2	Healthcare Representative	4152	3	11				
4	Healthcare Representative	13503	4	22				
3	Healthcare Representative	10673	3	10				
2	Healthcare Representative	5163	3	1				
3	Healthcare Representative	7484	4	13				
3	Healthcare Representative	10312	3	40				
3	Healthcare Representative	9439	3	5				
4	Healthcare Representative	13734	3	7				
2	Healthcare Representative	6673	3	1				
2	Healthcare Representative	4876	3	3				
3	Healthcare Representative	9396	3	4				
3	Healthcare Representative	10938	4	19				
2	Healthcare Representative	5582	4	9				
2	Healthcare Representative	4000	3	6				
4	Healthcare Representative	13496	3	20				
2	Healthcare Representative	4741	3	5				

2. IF THEN

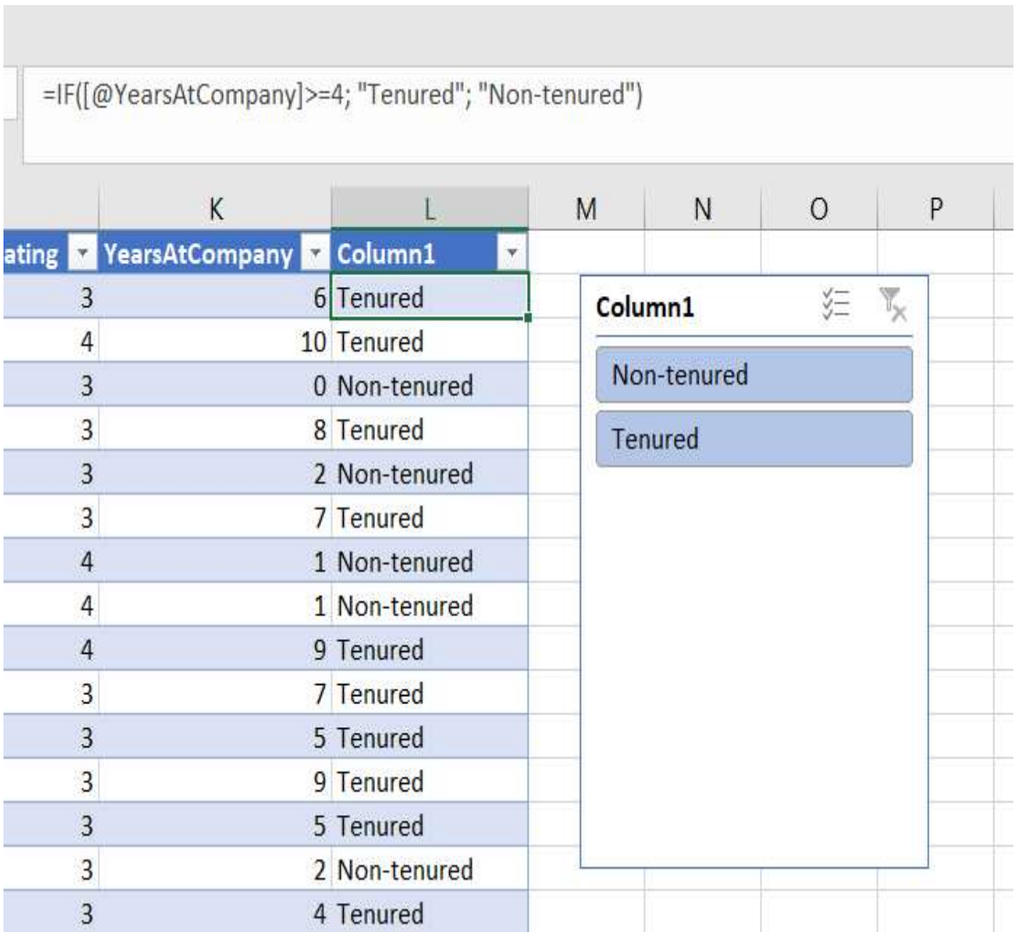
Often in HR data analysis projects, you want to insert your business logic into the data. This is where IF THEN statements can be very useful.

IF

The IF function can be used to test a logical statement, and produce a data value based on its result.

For example, employees in your company who have been working for over 4 years in your company are classified as tenured. This information is contained in the values YearsAtCompany column, but it is not explicit yet. It's not easy to filter or slice for that tenured status currently.

You could use Excel's IF function to create a new column containing this information, which you can then insert into a slicer for quick filtering and analysis.



COUNTIF & SUMIF

This IF-THEN logic can be expanded for more advanced analyses, and this is where the COUNTIF and SUMIF functions come in handy.

The COUNTIF function allows you to count all records in a selection that meet a certain condition. For example, you could count the number of tenured employees.

The SUMIF function allows you to summate all values in a selection that meet a certain condition. For example, you could calculate the total monthly salary for tenured employees.

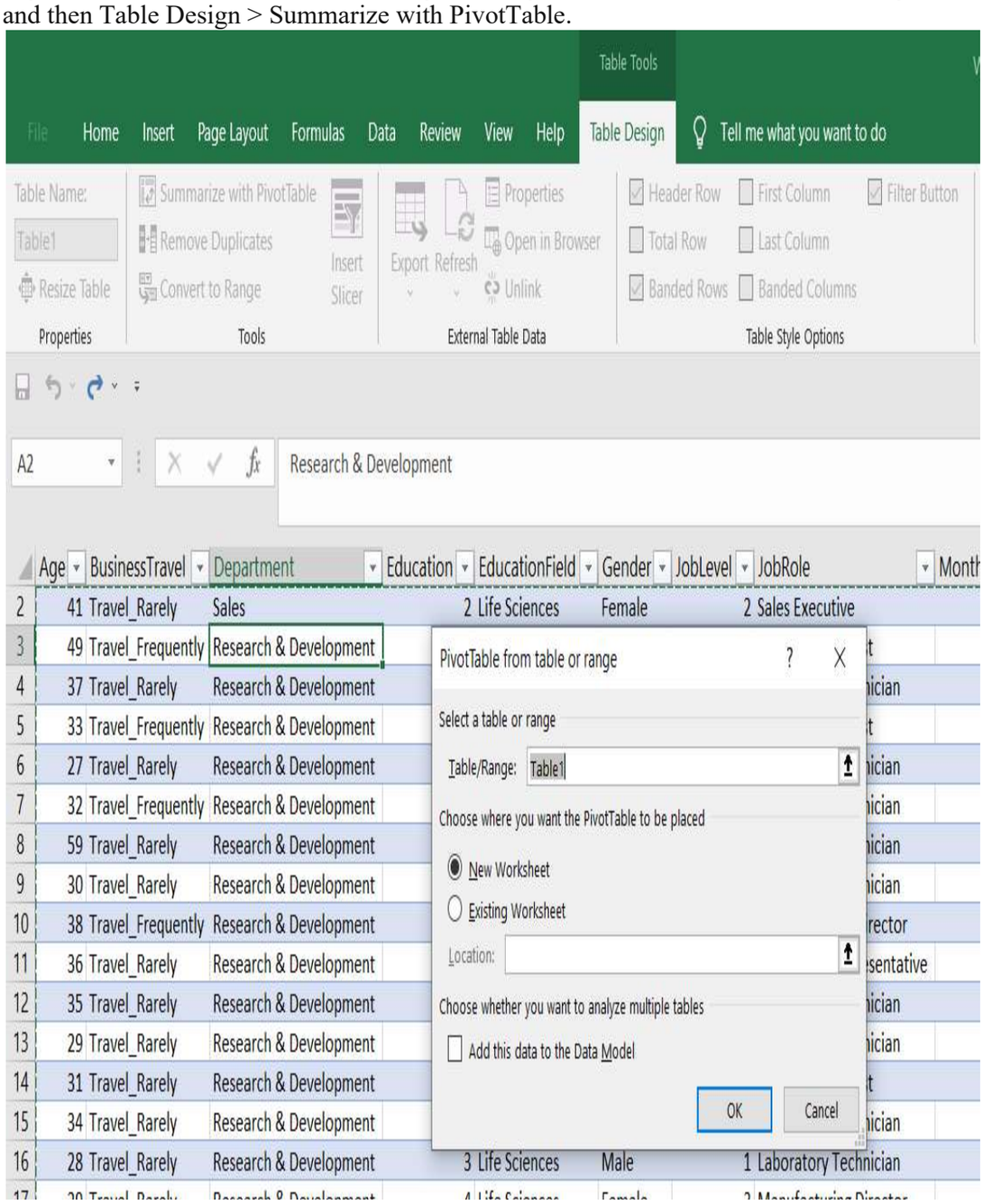
	A	B	C	D	E	F
1	MonthlyIncome	YearsAtCompany				
2	5993	6				
3	5130	10		**Tenured employees**	*Result*	*Function*
4	2090	0		**Count**	11	=COUNTIF(B2:B17; ">=4")
5	2909	8		**Total salary**	53401	=SUMIF(B2:B17; ">=4"; A2:A17)
6	3468	2				
7	3068	7				
8	2670	1				
9	2693	1				
10	9526	9				
11	5237	7				
12	2426	5				
13	4193	9				
14	2911	5				
15	2661	2				
16	2028	4				
17	9980	10				

This logic extends to the COUNTIFS and SUMIFS functions, which can count and sum values for records that meet multiple conditions, like employees being tenured and working as a director.

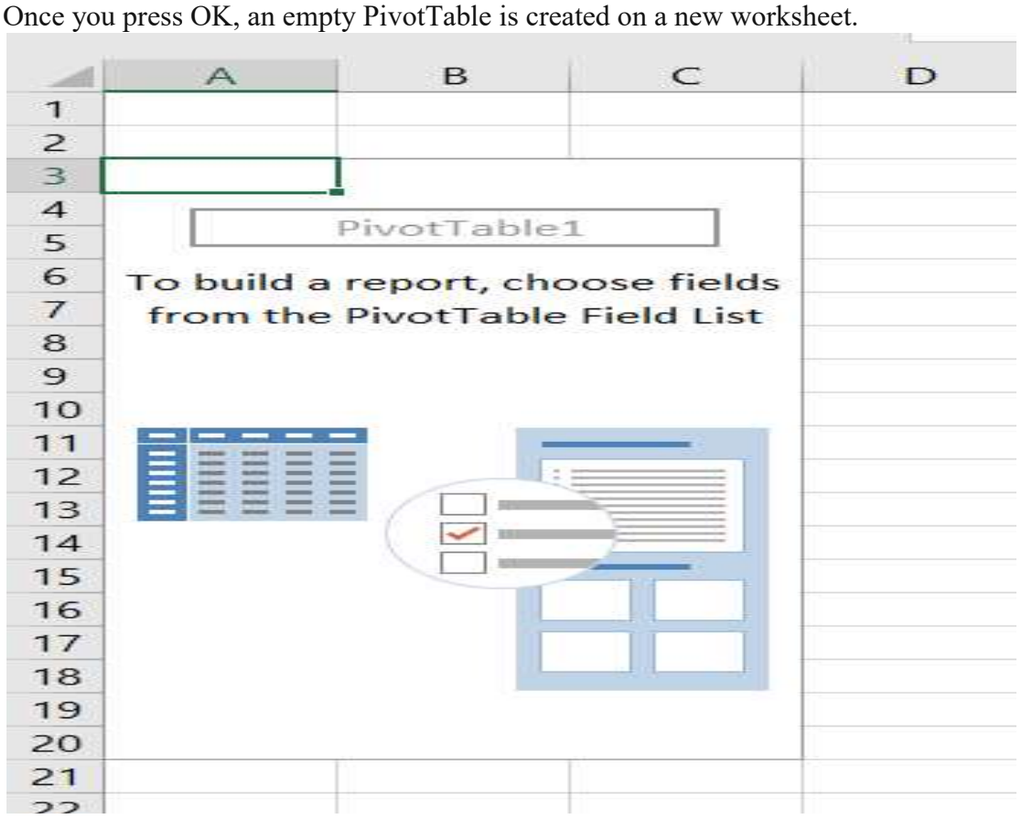
3. PivotTable

PivotTables is a power tool for any analyst using Excel. PivotTables allow you to skip a lot of the manual programming and focus on the data analysis.

If your data is in an Excel Table already, it's easy to create a PivotTable. Select any data cell in your table and then Table Design > Summarize with PivotTable.

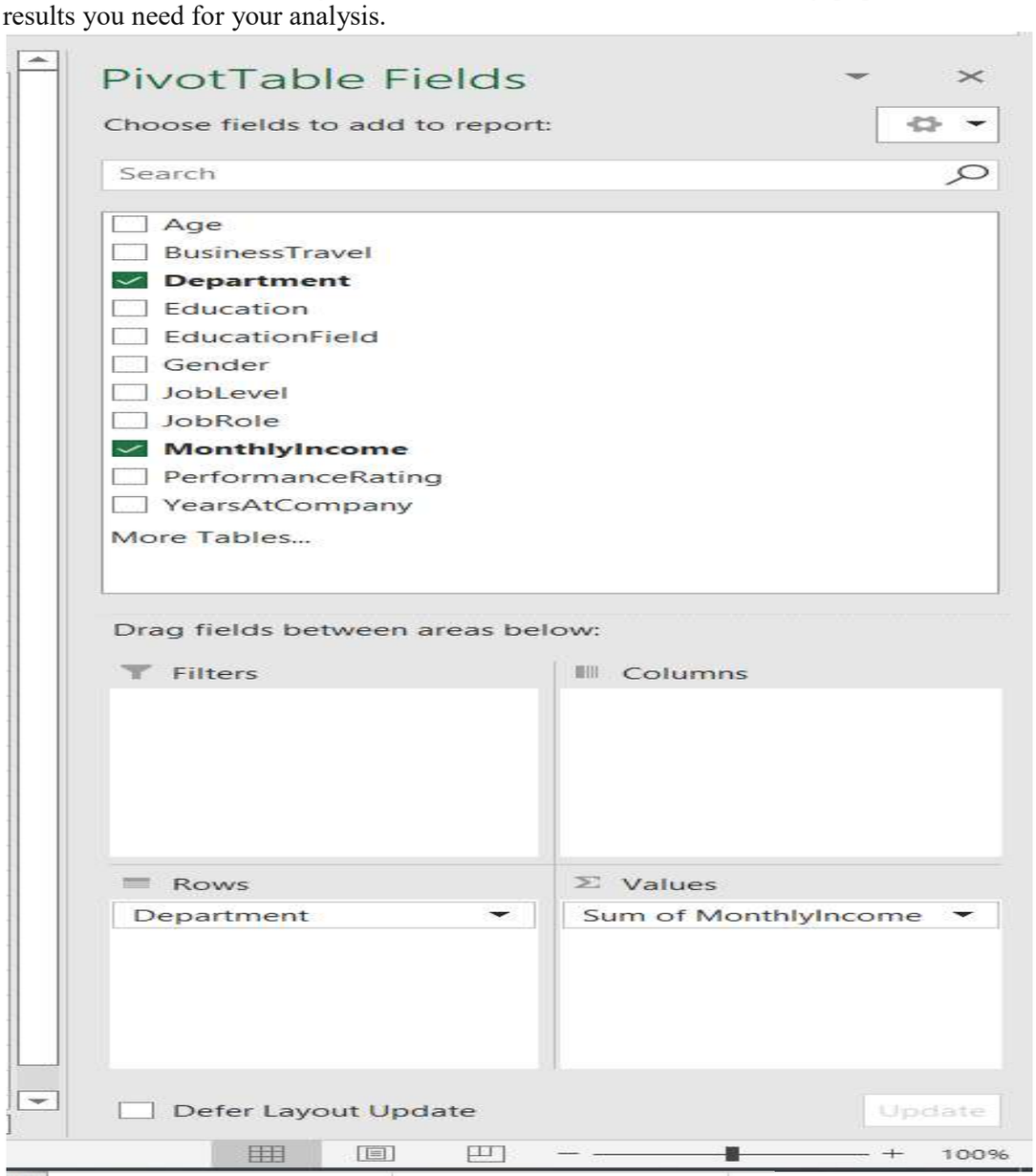


Once you press OK, an empty PivotTable is created on a new worksheet.



In the PivotTable Fields menu, you can now drag your columns to the respective boxes to create the summary table you need for your analysis.

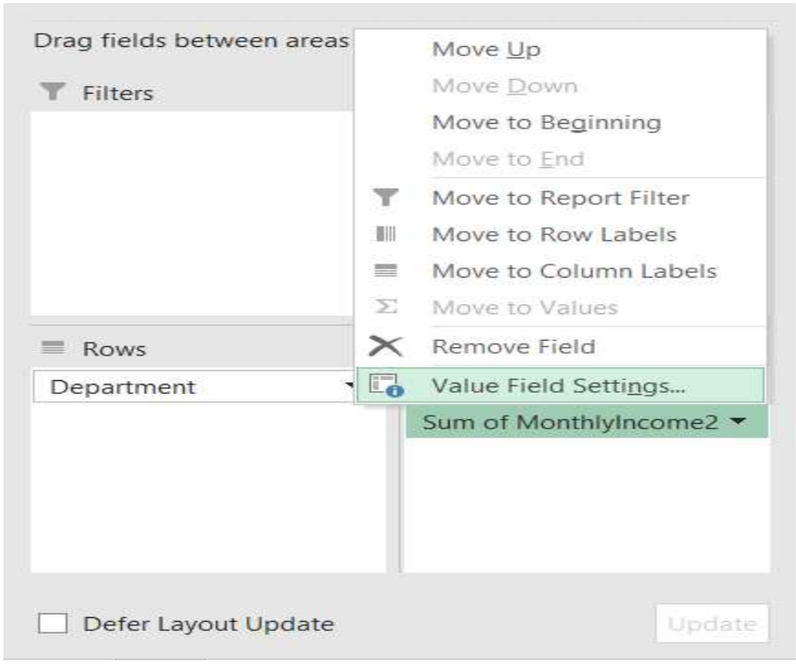
Suppose you want to analyze the overall salary spend per department. By setting the 'Department' column as the row and the 'MonthlyIncome' as the values, Excel automatically populates the PivotTable with the results you need for your analysis.



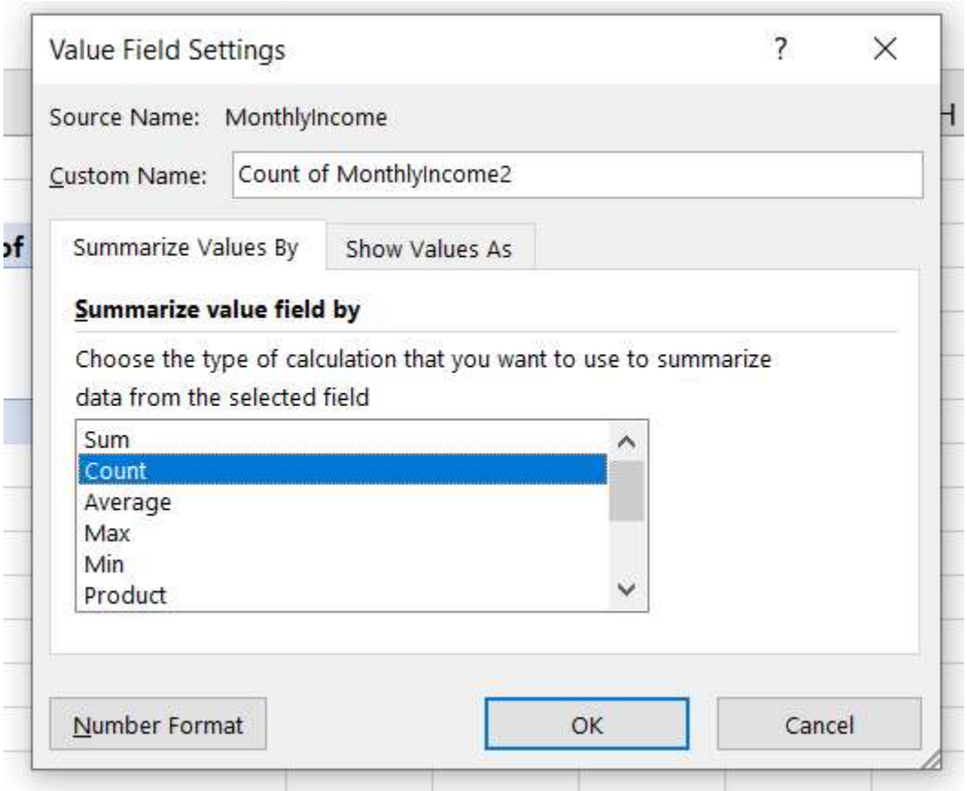
2		
3	**Row Labels**	**Sum of MonthlyIncome**
4	Human Resources	419234
5	Research & Development	6036284
6	Sales	3103791
7	**Grand Total**	**9559309**
8		

This prevents you from having to input this calculation manually by programming three SUMIF functions.

The COUNTIF logic can be implemented by adding the 'Monthly Income' to the 'Values' box, and then selecting the drop-down arrow to change the Value Field Settings.



This then opens up a menu where you can substitute the SUM logic, for the COUNT logic. Now you can view the size of each department.



Row Labels	Sum of MonthlyIncome	Count of MonthlyIncome2
Human Resources	419234	63
Research & Development	6036284	961
Sales	3103791	446
Grand Total	**9559309**	**1470**

Similarly, you can use PivotTables to quickly calculate other group-level summary statistics, like the average value, or the minimum or the maximum value per group.

PivotTables offer great versatility, allowing you to create complex, customizable reports in a matter of minutes.

For instance, below illustrates a comparison of the monthly salaries between the ‘HR’ and ‘Sales’ departments for different ‘Job Levels’. The table shows that salary policies seem to be similar across departments, though the minimum salaries are consistently lower in ‘Sales’.

		Salary			
Row Labels	# Employees	Total Spend	Minimum	Average	Maximum
⊟ Human Resources					
1	33	$90.196	$1.555	$2.733	$4.936
2	13	$72.325	$3.886	$5.563	$6.430
3	6	$57.738	$7.988	$9.623	$10.725
4	4	$64.590	$14.026	$16.148	$17.328
5	7	$134.385	$18.200	$19.198	$19.717
Human Resources Total	**63**	**$419.234**	**$1.555**	**$6.655**	**$19.717**
⊞ Research & Development	961	$6.036.284	$1.009	$6.281	$19.999
⊟ Sales					
1	76	$190.511	$1.052	$2.507	$4.400
2	240	$1.379.053	$2.086	$5.746	$9.998
3	83	$770.430	$7.082	$9.282	$13.591
4	34	$515.653	$11.836	$15.166	$17.875
5	13	$248.144	$18.041	$19.088	$19.847
Sales Total	**446**	**$3.103.791**	**$1.052**	**$6.959**	**$19.847**
Grand Total	**1470**	**$9.559.309**	**$1.009**	**$6.503**	**$19.999**

Step 3: Storytelling

Showing data and presenting it in neat tables will only get you so far when it comes to influencing decisions. Your insights can have a greater impact when you use storytelling and data visualization.

Storytelling is the art of using words and actions to reveal the elements and images of a story while encouraging the listener's imagination. Data visualization refers to representing information (i.e., data) in the form of a chart or diagram for enhanced interpretation.

Try to tell the story of how the problem you examined influences the daily experience of employees and the bottom-line performance of the business. Show visually what the problem is and what impact your proposed solution could have.

This will assist your decision-makers in quickly understanding the problem and assessing the right approach and solution.

1. Start with the audience

An analysis is meaningless if your target audience doesn't understand its insights. Using storytelling and data visualization can help your audience process your insights quickly and simply.

Consider how familiar your audience is with the concepts being represented and whether they have the technical capacity to interpret any visualizations you showcase.

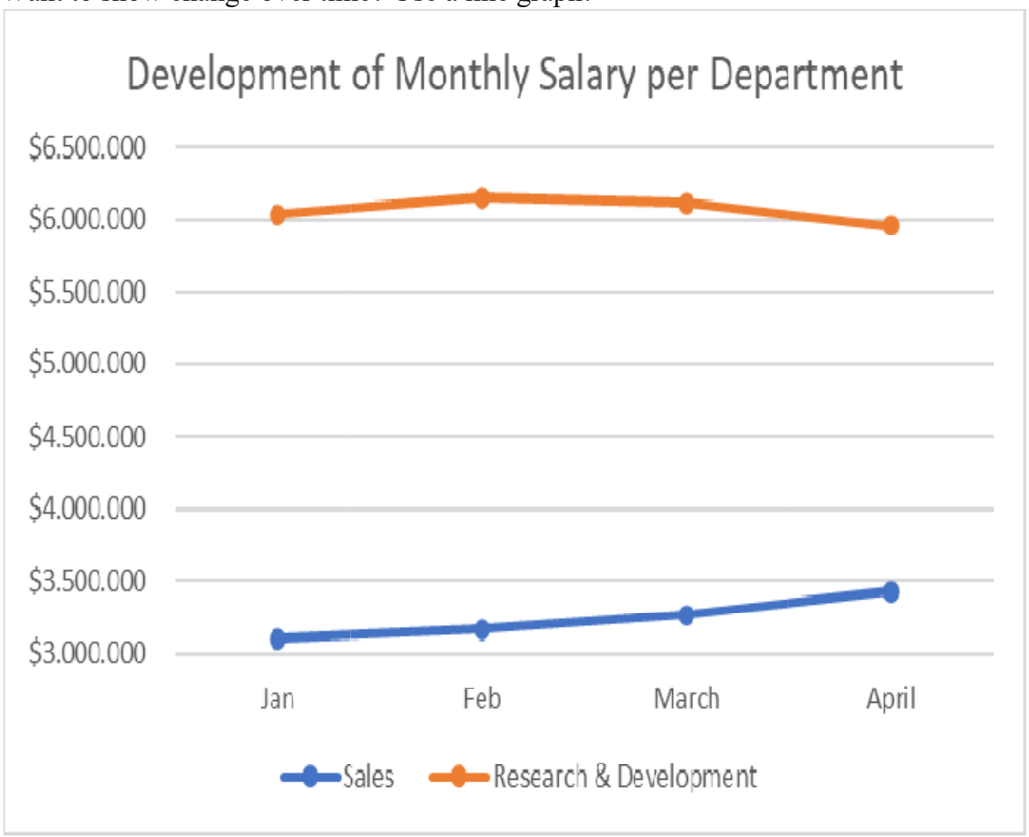
2. Pick the right chart

In Excel, you can find data visualization options under Insert > Charts

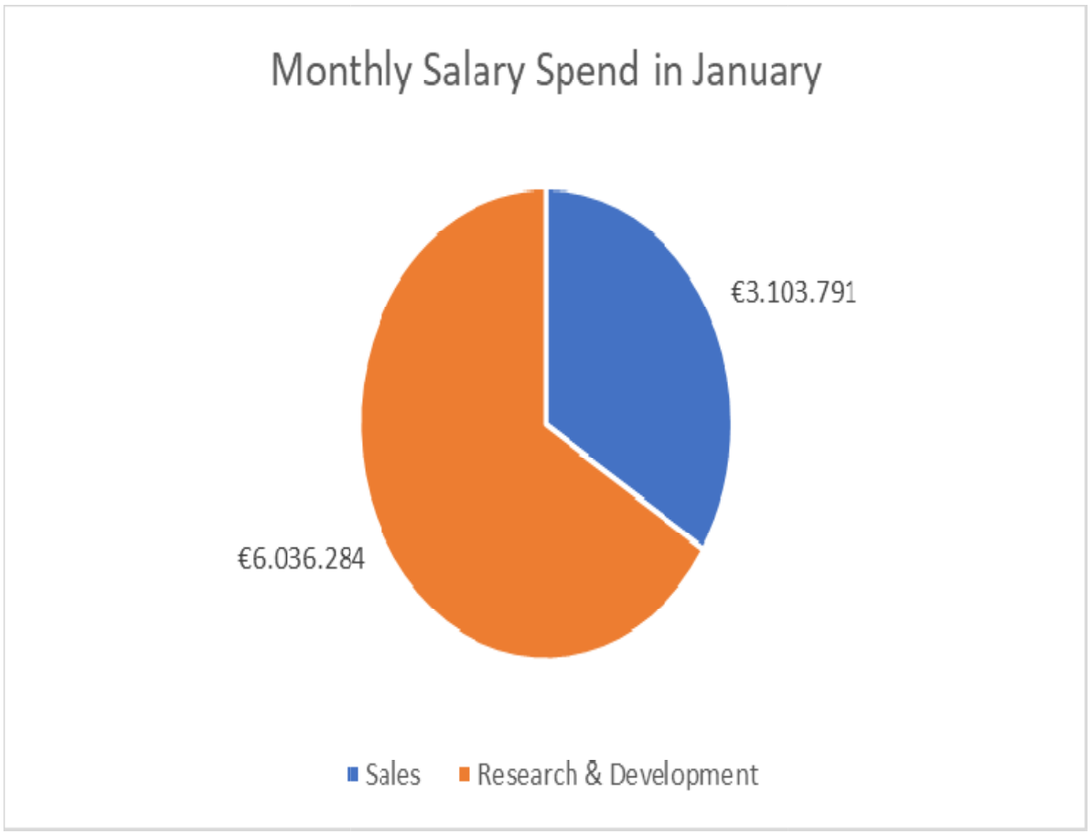
There are many different ways to visualize your data. Excel can create pie charts, bar charts, line graphs, scatterplots, waterfalls, and many others. Each of these charts works best for a certain type of data and a specific audience.

It's good practice to start with your main message and choose the chart that best communicates that message to your audience.

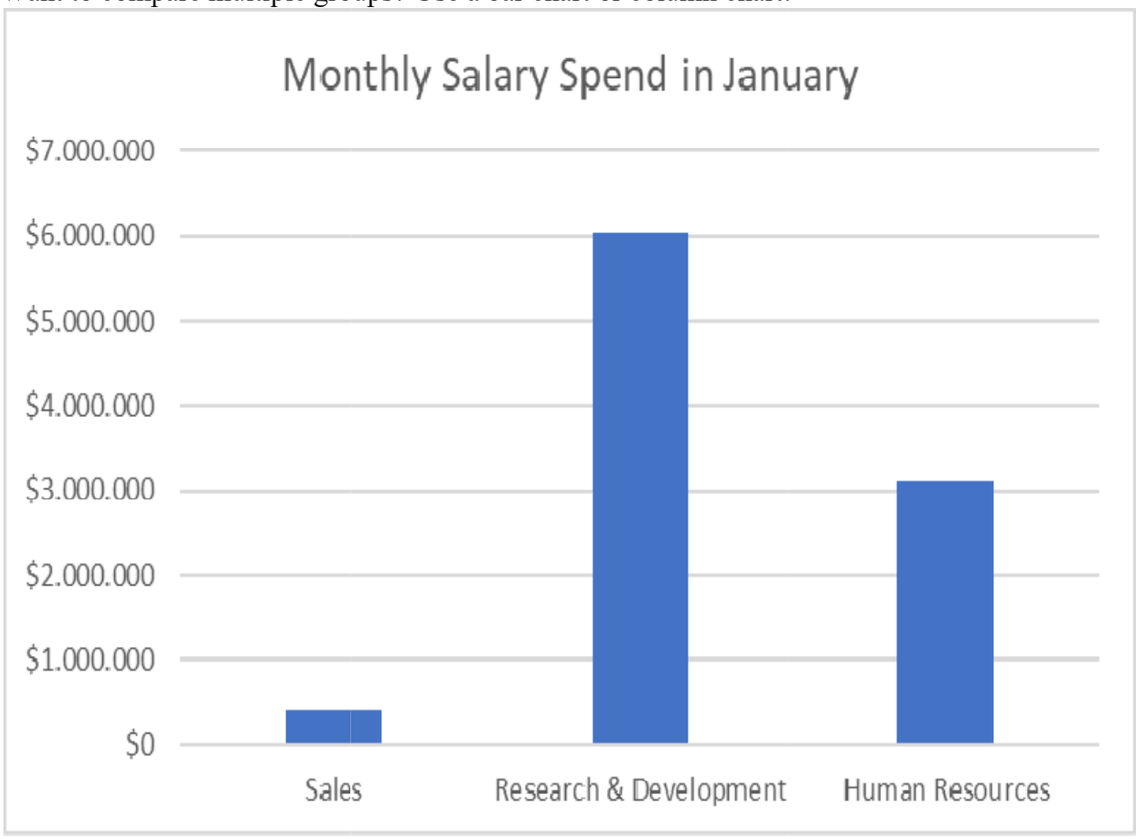
Want to show change over time? Use a line graph!



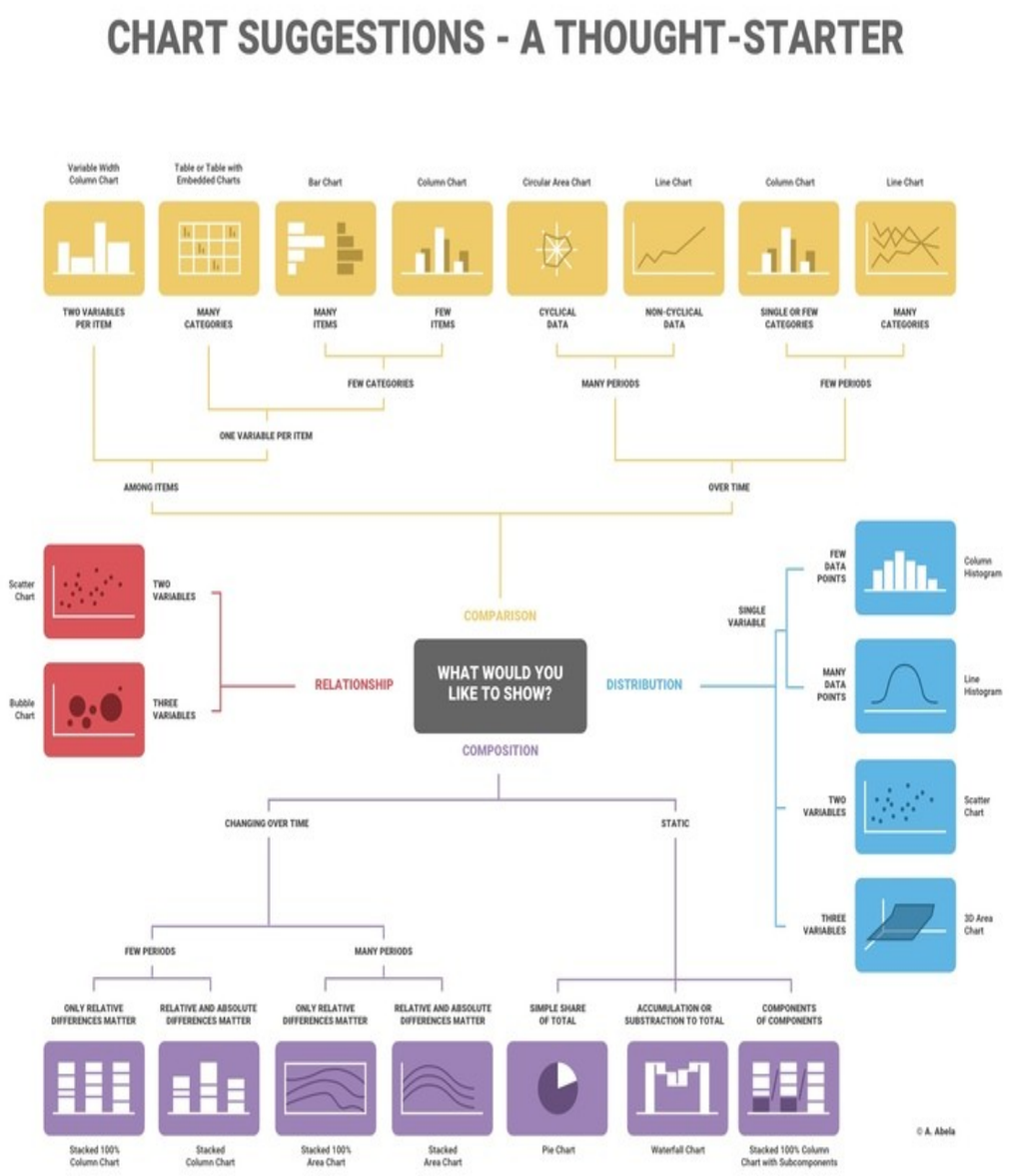
Want to show the proportion of a group to the whole? Use a pie chart!



Want to compare multiple groups? Use a bar chart or column chart!



Need some tips for choosing the right chart? Use a chart picker like this one:

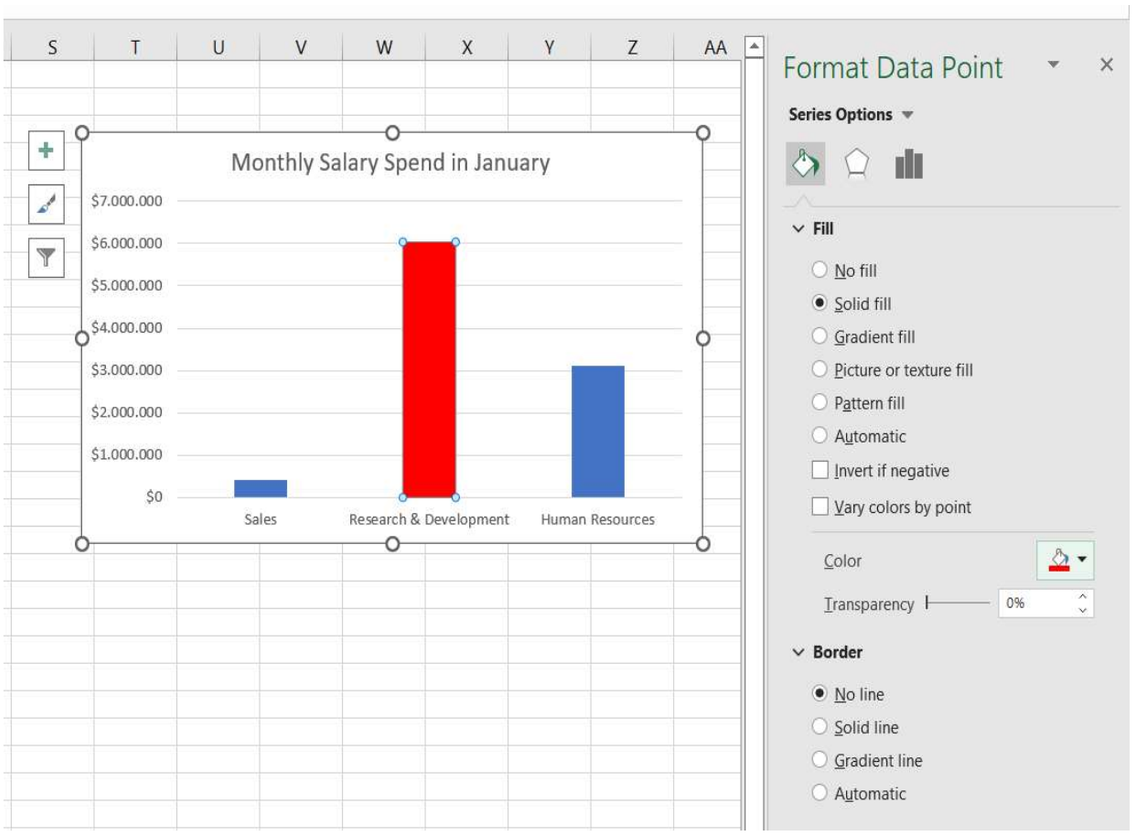


Source

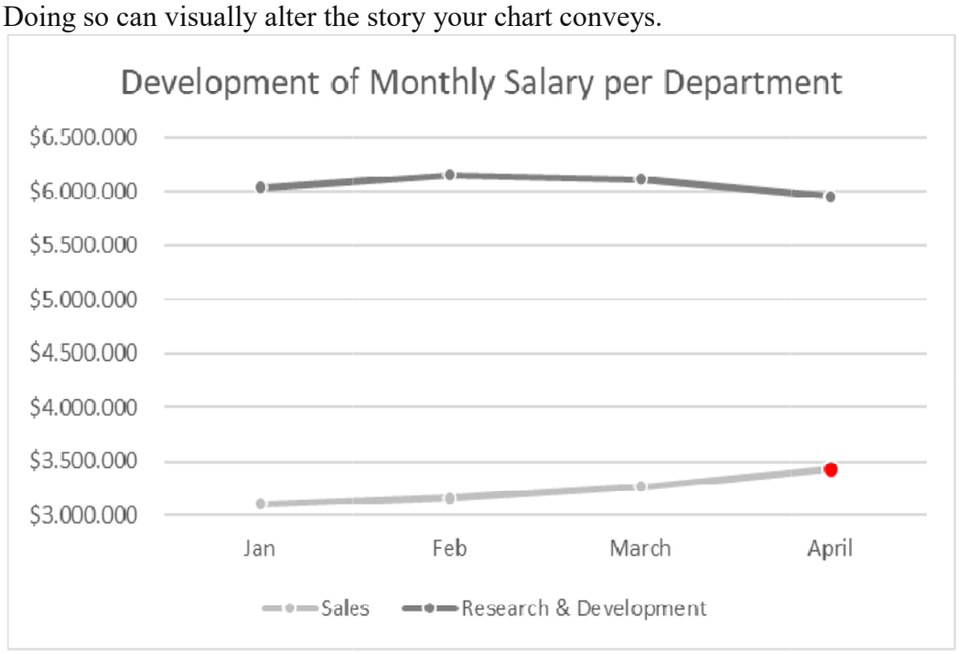
3. Color

Color can be an extremely powerful asset for your storytelling. For instance, you can use color to highlight a specific data point that is central to your insights.

In Excel, this is as simple as double-clicking a data point, navigating to the paint bucket, and changing the color.



Doing so can visually alter the story your chart conveys.



In general, it's good practice to use color sparingly and functionally to aid insight and storytelling.

Step 4: Dashboarding

Dashboards combine charts, tables, and KPIs in a useful overview to aid decision-making. Dashboards can be static or interactive – where users can select or change the way data is displayed.

Before you start building a dashboard, it's often best to start with some questions.

- What is the main decision process that the dashboard is used in?
- What decisions are made?
- And what information is needed to determine the right course of action?
- Is this a one-off information need, or does the dashboard need updating on a regular basis?
- Are insights needed on a company-level, division-wise, or for other subgroups?

Knowing the exact purpose and requirements of the dashboard helps you build the tool that has the largest impact on your business.

Shortcuts and skill-building tools

Building a dashboard can be quite complex. However, AIHR offers a comprehensive course on metrics and dashboards to help you learn more about these important elements of your analysis.

Looking for a quick win? AIHR has built a Resource Library that offers many tools for you to use, such as a headcount dashboard and handy downloadable Excel tools that save you from doing much of the work outlined in this article!

Want to further improve your analysis skills? AIHR offers an in-depth People Analytics Certificate Program to help you develop your analytics skill set.

Excel formulas for HR cheat sheet

If you've ever tried to analyze HR data in Excel, you know things can get overwhelming. With so many formulas out there, it's hard to know where to start, especially if you're juggling headcount reports, training logs, or salary data.

That's why we created this one-page Excel cheat sheet specifically for HR professionals. It highlights the formulas you're most likely to use, organized by task, with clear examples and use cases. This will help you move faster and quickly gain confidence in working with Excel.

HR Data Analytics:

Diagnostic Analytics:

Diagnostic analytics in HR involves analyzing past data to understand the reasons behind specific outcomes or trends. It goes beyond simply describing what happened (descriptive analytics) to explore why those events occurred. This deeper understanding allows HR professionals to identify root causes of issues, such as high employee turnover, low engagement, or performance problems, and develop targeted solutions.

Definition:

Diagnostic analytics is a type of data analysis that focuses on identifying the causes of past events or behaviors. In HR, it helps understand why employees leave, why engagement is low, or why certain performance trends exist. It's essentially a deep dive into the data to uncover the "why" behind the "what".

Examples in HR:

- **Employee Turnover:**
  Analyzing why employees are leaving, identifying patterns related to specific departments, job roles, or manager relationships, and understanding the reasons behind their decisions.
- **Employee Engagement:**
  Investigating factors that contribute to low employee engagement, such as lack of recognition, poor communication, or limited career development opportunities.
- **Performance Issues:**
  Determining the root causes of performance problems, whether they stem from inadequate training, lack of resources, or ineffective management.
- **Workplace Conflicts:**
  Analyzing the factors that contribute to workplace conflicts, such as communication breakdowns or personality clashes.

Cases:

- A company experiencing high employee turnover in its sales team might use diagnostic analytics to examine exit interviews, performance data, and employee satisfaction surveys. They might find that the turnover is primarily due to a demanding sales quota, lack of recognition for high performers, or inadequate onboarding processes.
- A tech company experiencing low employee engagement might use diagnostic analytics to analyze employee feedback from surveys, conduct focus groups, and examine data on employee participation in company events. This analysis might reveal that employees feel disconnected from the company's mission or lack opportunities for professional development.
- A manufacturing company struggling with production bottlenecks might use diagnostic analytics to examine workflow data, identify delays in specific processes, and understand the reasons behind those delays.

How it works:

Diagnostic analytics often involves techniques like:

- **Data Discovery:**
  Identifying relevant data sources and exploring the data to understand its structure and content.
- **Drill-Down:**
  Focusing on specific aspects of the data to identify patterns and trends.
- **Data Mining:**
  Using automated processes to extract information from large datasets and identify correlations.
- **Regression Analysis:**
  Examining the relationships between variables to understand how changes in one variable might affect another.

By applying these techniques, HR professionals can gain a deeper understanding of the factors driving employee behaviour and performance, enabling them to develop more effective and targeted interventions

COVARIANCE

In HR analytics, covariance is a statistical measure used to understand the direction of the relationship between two variables. It indicates how changes in one variable correspond to changes in another. A positive covariance suggests that as one variable increases, the other tends to increase, and vice versa. A negative covariance indicates an inverse relationship, where an increase in one variable is associated with a decrease in the other.

Here's a breakdown of how covariance is used in HR analytics:

1. Understanding Relationships between HR Metrics:

- Covariance can be used to explore how different HR metrics relate to each other. For example, you might want to see if there's a relationship between employee training hours and performance ratings.
- A positive covariance might suggest that increased training leads to better performance, while a negative covariance could indicate that training doesn't have a positive impact or even has a negative impact on performance.

2. Identifying Potential Predictors:

- By analyzing the covariance between various factors (like employee engagement, work experience, or education) and outcomes (like turnover, productivity, or promotion rates), HR can identify potential predictors of these outcomes.
- This information can be used to develop predictive models and targeted interventions.

3. Guiding HR Strategies:

- Understanding the direction of relationships between variables can help HR professionals design more effective strategies. For instance, if a high level of employee satisfaction shows a positive covariance with retention, HR might prioritize initiatives to boost satisfaction.
- Covariance analysis can also help identify areas where interventions might not be effective or even counterproductive.

Key Considerations:

- **Covariance vs. Correlation:**

While covariance indicates the direction of a relationship, it doesn't measure the strength or magnitude of the relationship. Correlation, which is a standardized version of covariance, provides a more interpretable measure of the relationship's strength.

- **Limitations:**
  Covariance is sensitive to the scale of the variables. A large covariance doesn't necessarily mean a strong relationship, especially if the variables are measured on vastly different scales.
- **Interpretation:**
  It's crucial to interpret covariance results cautiously and consider other factors that might be influencing the observed relationships.
  Example in HR:
  Imagine you're analyzing the relationship between employee absenteeism and productivity. If you find a negative covariance, it suggests that as absenteeism increases, productivity tends to decrease. This insight could lead HR to investigate the causes of absenteeism and implement programs to reduce it.

In mathematics and statistics, covariance is a measure of the relationship between two random variables. The metric evaluates how much – to what extent – the variables change together. In other words, it is essentially a measure of the variance between two variables. However, the metric does not assess the dependency between variables.

Unlike the correlation coefficient, covariance is measured in units. The units are computed by multiplying the units of the two variables. The variance can take any positive or negative values. The values are interpreted as follows:

- **Positive covariance**: Indicates that two variables tend to move in the same direction.
- **Negative covariance**: Reveals that two variables tend to move in inverse directions.

In finance, the concept is primarily used in portfolio theory. One of its most common applications in portfolio theory is the diversification method, using the covariance between assets in a portfolio. By choosing assets that do not exhibit a high positive covariance with each other, the unsystematic risk can be partially eliminated.

Formula for Covariance

The covariance formula is similar to the formula for correlation and deals with the calculation of data points from the average value in a dataset. For example, the covariance between two random variables X and Y can be calculated using the following formula (for population):

$$\text{Cov}(X, Y) = \frac{\sum(X_i - \bar{X})(Y_j - \bar{Y})}{n}$$

For a sample covariance, the formula is slightly adjusted:

$$\text{Cov}(X, Y) = \frac{\sum(X_i - \bar{X})(Y_j - \bar{Y})}{n - 1}$$

Where:

- $\mathbf{X_i}$ – the values of the X-variable
- $\mathbf{Y_j}$ – the values of the Y-variable
- $\bar{\mathbf{X}}$ – the mean (average) of the X-variable
- $\bar{\mathbf{Y}}$ – the mean (average) of the Y-variable
- **n** – the number of data points

Covariance vs. Correlation

Covariance and correlation both primarily assess the relationship between variables. The closest analogy to the relationship between them is the relationship between the variance and standard deviation.

Covariance measures the total variation of two random variables from their expected values. Using covariance, we can only gauge the direction of the relationship (whether the variables tend to move in tandem or show an inverse relationship). However, it does not indicate the strength of the relationship, nor the dependency between the variables.

On the other hand, **correlation** measures the strength of the relationship between variables. Correlation is the scaled measure of covariance. It is dimensionless. In other words, the correlation coefficient is always a pure value and not measured in any units.

The relationship between the two concepts can be expressed using the formula below:

$$\rho(X,Y) = \frac{Cov(X,Y)}{\sigma_X \sigma_Y}$$

Where:

- **ρ(X,Y)** – the correlation between the variables X and Y
- **Cov(X,Y)** – the covariance between the variables X and Y
- **σ_X** – the standard deviation of the X-variable
- **σ_Y** – the standard deviation of the Y-variable

Example of Covariance

John is an investor. His portfolio primarily tracks the performance of the S&P 500 and John wants to add the stock of ABC Corp. Before adding the stock to his portfolio, he wants to assess the directional relationship between the stock and the S&P 500.

John does not want to increase the unsystematic risk of his portfolio. Thus, he is not interested in owning securities in the portfolio that tend to move in the same direction.

John can calculate the covariance between the stock of ABC Corp. and S&P 500 by following the steps below:

1. Obtain the data.

First, John obtains the figures for both ABC Corp. stock and the S&P 500. The prices obtained are summarized in the table below:

	S&P 500	ABC Corp.
2013	1,692	68
2014	1,978	102
2015	1,884	110
2016	2,151	112
2017	2,519	154

2. Calculate the mean (average) prices for each asset.

$$\text{Mean (S\&P 500)} = \frac{1{,}692 + 1{,}978 + 1{,}884 + 2{,}151 + 2{,}519}{5} = 2{,}044.80$$

$$\text{Mean (ABC Corp.)} = \frac{68 + 102 + 110 + 112 + 154}{5} = 109.20$$

3. for each security, find the difference between each value and mean price.

			Step 3		Step 4
	S&P 500	ABC Corp.	a	b	a x b
2013	1,692	68	-352.80	-41.20	14,535.36
2014	1,978	102	-66.80	-7.20	480.96
2015	1,884	110	-160.80	0.80	-128.64
2016	2,151	112	106.20	2.80	297.36
2017	2,519	154	474.20	44.80	21,244.16
Mean	**2,044.80**	**109.20**	**Sum**		**36,429.20**

			Step 3		Step 4
	S&P 500	ABC Corp.	a	b	a x b
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2015	1,884	110	-160.80	0.80	-128.64
2016	2,151	112	106.20	2.80	297.36
2017	2,519	154	474.20	44.80	21,244.16
Mean	**2,044.80**	**109.20**	**Sum**		**36,429.20**

4. Multiply the results obtained in the previous step.

5. Using the number calculated in step 4, find the covariance.

$$\text{Cov(S\&P 500, ABC Corp.)} = \frac{36{,}429.20}{5 - 1} = 9{,}107.30$$

In such a case, the positive covariance indicates that the price of the stock and the S&P 500 tend to move in the same direction.

Simple and multiple correlation

Simple and multiple correlation both measure the relationship between variables, but differ in the number of variables studied. Simple correlation examines the relationship between only two variables, while multiple correlation investigates the relationship between one dependent variable and two or more independent variables.

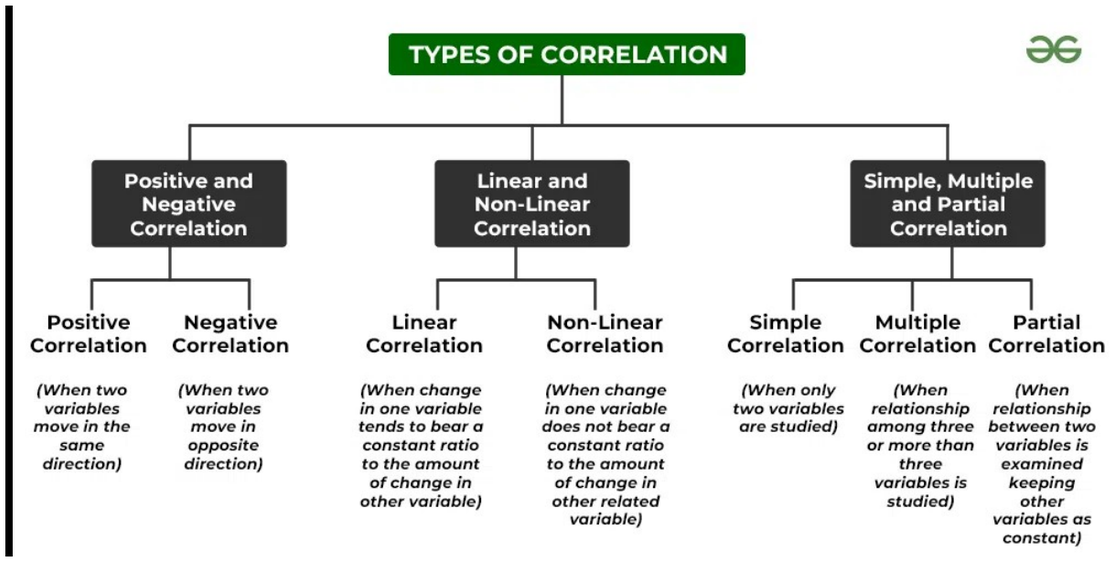
Simple Correlation:

- **Definition:**
  Simple correlation, also known as bivariate correlation, focuses on the relationship between two variables.
- **Purpose:**
  It assesses the strength and direction (positive or negative) of the linear association between two variables.
- **Example:**
  Analyzing the correlation between rainfall and crop yield.
- **Coefficient:**
  The correlation coefficient (r) ranges from -1 to +1, where -1 represents a perfect negative correlation, 0 no correlation, and +1 a perfect positive correlation.
- **Calculation:**
  The correlation coefficient is calculated using a formula that takes into account the covariance of the two variables and their standard deviations.

Multiple Correlation:

- **Definition:**
  Multiple correlation explores the relationship between one dependent variable and two or more independent variables.
- **Purpose:**
  It determines how well the dependent variable can be predicted based on the linear combination of the independent variables.
- **Example:**
  Investigating the correlation between cola drink demand and factors like price, temperature, and income.
- **Coefficient:**
  The multiple correlation coefficient, denoted as R, also ranges from 0 to 1, where 0 indicates no correlation and 1 a perfect correlation.
- **Calculation:**
  Multiple correlation involves a more complex formula that accounts for the correlation between the dependent variable and each independent variable, as well as the relationships between the independent variables themselves.

Types of Correlation



Correlation can be classified based on various categories:

Based on the direction of change in the value of two variables, correlation can be classified as:

1. Positive Correlation:

When two variables move in the same direction; i.e., when one increases the other also increases and vice-versa, then such a relation is called a **Positive Correlation.** ***For example,*** Relationship between the price and supply, income and expenditure, height and weight, etc.

Simultaneous increase in the value of both the Variables		Simultaneous decrease in the value of both the Variables	
X	Y	X	Y
20	120	60	500
30	170	50	400
40	220	40	300
50	270	30	200
60	320	20	100

2. Negative Correlation:

When two variables move in opposite directions; i.e., when one increases the other decreases, and vice-versa, then such a relation is called a **Negative Correlation.** ***For example,*** the relationship between the price and demand, temperature and sale of woollen garments, etc.

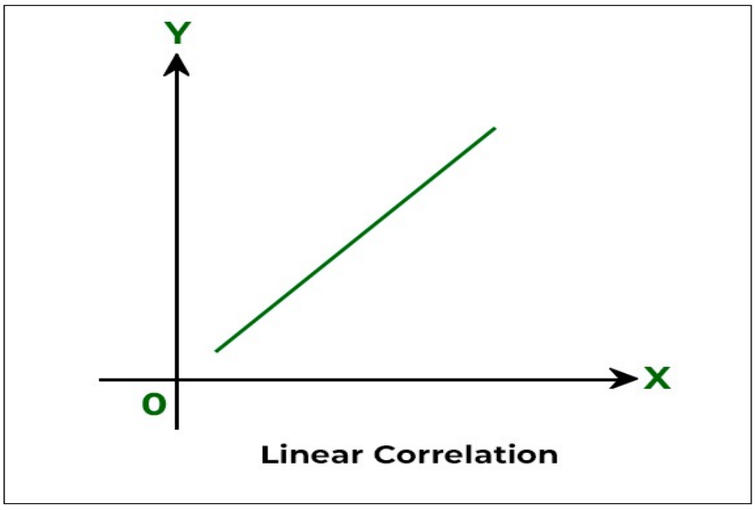
Rise in the value of one variable (X) and fall in other (Y)		Rise in the value of one variable (Y) and fall in other (X)	
X	Y	X	Y
10	100	250	100
20	90	200	k200
30	80	150	300
40	70	100	400
50	60	50	500

Based on the ratio of variations between the variables, correlation can be classified as:

1. Linear Correlation:

When there is a constant change in the amount of one variable due to a change in another variable, it is known as **Linear Correlation.** This term is used when two variables change in the same ratio. If two variables that change in a fixed proportion are displayed on graph paper, a straight- line will be used to represent the relationship between them. As a result, it suggests a linear relationship.

X	10	15	20	25	30
Y	10	20	30	40	50

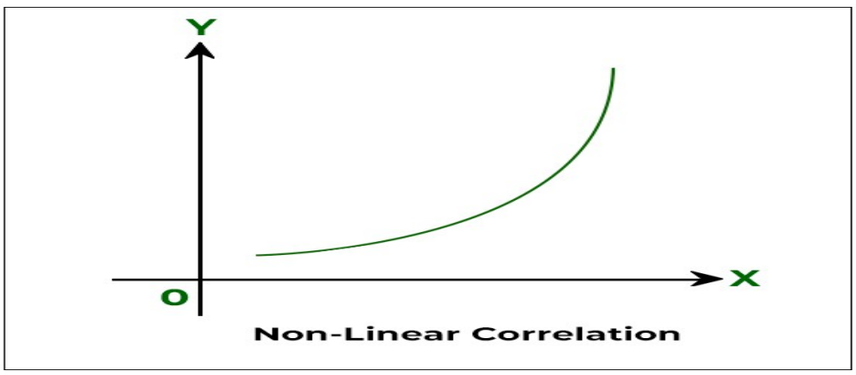


In the above graph, for every change in the variable X by 5 units there is a change of 10 units in variable Y. The ratio of change of variables X and Y in the above schedule is 1:2 and it remains the same, thus there is a linear relationship between the variables.

2. Non-Linear (Curvilinear) Correlation:

When there is no constant change in the amount of one variable due to a change in another variable, it is known as a **Non-Linear Correlation.** This term is used when two variables do not change in the same ratio. This shows that it does not form a straight-line relationship. ***For example*****,** the production of grains would not necessarily increase even if the use of fertilizers is doubled.

X (Fertilizers)	10	20	30	40	50
Y (Production of Grains)	7	12	19	25	35



In the above schedule, there is no specific relationship between the variables. Even though both change in the same direction i.e. both are increasing, they change in different proportions. The ratio of change of variables X and Y in the above schedule is not the same, thus there is a non-linear relationship between the variables.

Based on the number of variables involved, correlation can be classified as:

1. Simple Correlation:

Simple correlation implies the study between the two variables only. ***For example,*** the relationship between price and demand, and the relationship between price and money supply.

2. Partial Correlation:

Partial correlation implies the study between the two variables keeping other variables constant. ***For example,*** the production of wheat depends upon various factors like rainfall, quality of manure, seeds, etc. But, if one studies the relationship between wheat and the quality of seeds, keeping rainfall and manure constant, then it is a partial correlation.

3. Multiple Correlation:

Multiple correlation implies the study between three or more three variables simultaneously. The entire set of independent and dependent variables is studied simultaneously. ***For example,*** the relationship between wheat output with the quality of seeds and rainfall.

Degree of Correlation

The degree of correlation is measured through the coefficient of correlation. The degree of correlation for the given variables can be expressed in the following ways:

1. Perfect Correlation:

If the relationship between the two variables is in such a way that it varies in equal proportion (increase or decrease) it is said to be perfectly correlated. This can be of two types:

- **Positive Correlation:** When the proportional change in two variables is in the same direction, it is said to be positively correlated. In this case, the Coefficient of Correlation is shown as **+1**.
- **Negative Correlation:** When the proportional change in two variables is in the opposite direction, it is said to be negatively correlated. In this case, the Coefficient of Correlation is shown as **-1**.

2. Zero Correlation:

If there is no relation between two series or variables, it is said to have zero or no correlation. It means that if one variable changes and it does not have any impact on the other variable, then there is a lack of correlation between them. In such cases, the Coefficient of Correlation will be **0.**

3. Limited Degree of Correlation:

There is a situation with a limited degree of correlation between perfect and absence of correlation. In real life, it was found that there is a limited degree of correlation.

- The coefficient of correlation, in this case, lies between +1 and -1.
- Correlation is limited negative when there are unequal changes in the opposite direction.
- Correlation is limited and positive when there are unequal changes in the same direction.
- The degree of correlation can be **low** (when the coefficient of correlation lies between 0 and 0.25), **moderate** (when the coefficient of correlation lies between 0.25 and 0.75), or **high** (when the coefficient of correlation lies between 0.75 and 1).

Within these limits, the value of correlation can be interpreted as:

Degree of Correlation

Degree of Correlation	Positive Correlation	Negative Correlation
Perfect Correlation	+1	-1
Very High Degree of Correlation	+0.9	-0.9
Fairly High Degree of Correlation	Between +0.75 and +0.9	Between -0.75 and -0.9
Moderate Degree of Correlation	Between +0.25 and +0.75	Between -0.25 and -0.75
Low Degree of Correlation	Between 0 and+0.25.	Between 0 and -0.25.
Zero/No Correlation (uncorrelated)	0	0

To gain hands-on experience with Excel, one can utilize various resources like online exercises, tutorials, and practical courses. Focus on learning fundamental Excel concepts like formulas, functions, and data manipulation, then progress to more advanced topics like Power Pivot and Power Query. Real-world scenarios and practice exercises will solidify your understanding and build practical skills.
This video provides a comprehensive guide to Excel, covering tabs, ribbons, groups, and navigation:

59s

Teacher's Tech
YouTube · 12 Feb 2024

Here's a breakdown of how to approach hands-on Excel practice:
1. Start with the Basics:

- **Interface:**
  Familiarize yourself with the Excel interface, including the ribbon, tabs, and different sections.
- **Data Entry:**
  Practice entering data into cells, formatting it (numbers, text, dates), and using basic data validation.
- **Formulas and Functions:**
  Learn how to use common formulas like SUM, AVERAGE, MIN, MAX, COUNT, and IF statements. Also explore string manipulation functions like CONCAT, and TRIM.
- **Navigation:**
  Master keyboard shortcuts for navigating cells, selecting ranges, and performing actions quickly. For example, use the magic stance (F2 and Escape keys) to quickly edit cells and navigate through them.
  This video demonstrates how to navigate Excel like a pro using keyboard shortcuts:

1m

Mouse Trap
YouTube · 17 Mar 2021

2. Online Excel Practice:

- **Excel Exercises:**
  Explore websites like Excel Exercises that offer interactive exercises and practice spreadsheets to reinforce your learning.
- **YouTube Tutorials:**
  Utilize platforms like YouTube (e.g., Leila Gharani's channel) to find video tutorials and demonstrations of various Excel features and techniques.
- **Free Excel Exercises:**
  Wise Owl Training offers a collection of free Excel exercises that cover different functions and scenarios.
  This video provides a tutorial on using rows and columns in Excel:

55s

Learnit Training
YouTube · 29 Mar 2024

3. Advanced Excel Concepts:

- **PivotTables:** Learn how to create and use PivotTables to summarize and analyze large datasets.
- **Power Query:** Explore Power Query for importing, cleaning, and transforming data from various sources.
- **Power Pivot:** Discover Power Pivot for advanced data modeling and analysis.

4. Practical Application:

- **Real-world Scenarios:**
  Try to apply your Excel skills to solve real-world problems, such as creating budgets, tracking expenses, or analyzing sales data.
- **Downloadable Spreadsheets:**
  Look for practice spreadsheets that simulate real-world scenarios, like those offered by Excel Exercises.
- **Project-based Learning:**
  Break down complex tasks into smaller projects and work through them step-by-step.

5. Tips for Effective Learning:

- **Consistency:** Dedicate regular time slots for Excel practice to build a strong foundation.
- **Focus on Understanding:** Don't just memorize formulas; try to understand the logic behind them.
- **Experiment and Explore:** Don't be afraid to try new things and experiment with different features.
- **Seek Help When Needed:** Don't hesitate to ask for help from online forums, communities, or colleagues when you encounter challenges.

By following these steps and utilizing available resources, you can build a strong foundation in Excel and develop the skills to tackle real-world problems effectively.

EXCELPRACTICAL-1

The following worksheet contains Roll. Nos. &Marks in 5 subject of a student. Calculate his grades as per the following :

Marks	**Grades**
0-40	4
40-50	3
50-60	2
60&above	1

	A	**B**	**C**	**D**	**E**	**F**
1	RollNo.	ENG	HINDI	SCIENCE	MATHS	SO.SCI
2	110	45	56	67	**78**	**60**
3	GRADE					
4						
5						
6						
7						
8						
9						
10						
11						

Answer:

Enter headings & data as shown in columns A to F To

calculate GRADES using HLOOKUP

1. Enter Marks & Grades in rows 8 & 9 as follows

	A	**B**	**C**	**D**	**E**
8	MARKS	0	40	50	**60**
9	GRADE	4	3	2	**1**

2. At B3enter=HLOOKUP (B2,$B$8:$E$9,2)

3. Grade is displayed for the first subject. Drag the formula up to F3 to get grades for all the subjects.

The following worksheet contains Names & Sale for 10 salesmen.

Calculate their bonus as per the following :

Sale	**Bonus**
0-30000	0
30000-40000	3000
40000-50000	4000
50000-60000	5000
60000-70000	6000
70000-80000	7000
80000 & above	8000

	A	**B**	**C**	**D**			**H**	**I**
1	NAME	SALE	BONUS				0	0
2	Deep	30000					**30000**	3000
3	Jayesh	40000					**40000**	4000
4	Yash	45000					**50000**	5000
5	Sara	48000					**60000**	6000
6	Gita	55000					**70000**	7000
7	Jinal	32000					**80000**	8000
8	Kavita	66000						
9	Minal	23000						
10	Naresh	43000						
11	Rima	37000						

Answer:

Enter headings &data as shown in columns A to F To

calculate BONUS using VLOOKUP

1. Enter Sale & Bonus in columns H & I as follows

H	**I**
0	0
30000	3000
40000	4000
50000	5000
60000	6000
70000	7000
80000	8000

2. At C2 enter =VLOOKUP (B2,$H$1:$I$7,2)
3. BONUS is displayed for the first salesman. Drag the formula upto C11 to get bonus for all the salesmen.

The following worksheet contains Customer No., Number of units consumed for 10 customers.

Calculate their bill amount as per the following:

Numberofunits	**Rate**
<200	Rs.3
>=200,<500	Rs.6
>=500	Rs.10

	A	**B**	**C**	**D**			**H**	**I**
1	Cust. No.	No.of Units	Rate	Bill Amount			Units	Rate
2	1101	340					**0**	**3**
3	1102	180					**200**	6
4	1103	400					**500**	8
5	1104	600						
6	1105	350						
7	1106	470						
8	1107	890						
9	1108	200						
10	1109	500						
11	1110	360						

Answer:

Enter headings & data as shown in columns H to I To

calculate RATE using LOOKUP

1. Enter Units & Rate in columns H&I as follows

H	**I**
0	**3**
200	6
500	8

2. At C2 enter = LOOK UP (B2,$H$2:$H$4,$I$2:$I$4)
3. Rate is displayed for the first customer. Drag the formula upto C11 to get bonus for all the customers.
4. In D2 enter the formula=B2*C2
5. Bill amount is displayed for the first customer. Drag the formula upto D11 to get bonus for all the customers.

****

EXCELPRACTICAL– 2

Q1. A worksheet contains Roll Number, Marks in 2 subjects for 50 students in a class. Calculate Result and Grade using the following:

A student is declared as PASS if he gets 40 or more in both the subjects, Otherwise FAIL.

All FAILED students will be given Grade IV

For PASSED students Grade will be obtained as follows:

AVERAGE	GRADE
>=60	I
<60but>=50	II
<50but>=40	III

	A	B	C	D	E	F
1	ROLL	SUB1	SUB 2	AVERAGE	RESULT	GRADE
:						
51						

Answer:

Enter headings and data as shown above

Tocalculate AVERAGE

In cell D2 enter the formula= AVERAGE (B2:C2)or =(B2+C2)/2and press enter key It shows AVERAGE for the first student

Drag the formula up to D51

Tofind RESULT

In cell E2 enter the formula=IF (AND(B2>=40,C2>=40),”PASS”,”FAIL”) and press enter key

It shows Result for the first student

Drag the formula up to E51

Tofind GRADE

In cell E2 enter the formula=IF (E2=”FAIL”,”IV”,IF(D2>=60,”I”,IF(D2>=50,”II”,”III”)))and Press enter key

It shows Grade for the first student

Drag the formula up to E51

Q2. The following worksheet contains Name & Sales of 10 sales men. Calculate commission as per the following:

Sales	Commission
First 30,000	5%
Next 40,000	10%
Excess	15%

	A	B	C
1	NAME	SALE	COMMISSION
2			
:			
:			
11			

Answer:

Enter headings and data as shown above

Tocalculate commission

In cellC2 enter the formula

=IF (B2<30000,B2*5%,IF(B2<=70000,1500+(B2-30000)*10%,1500+4000+(B2-70000)*15%))
And press enter key

It shows Commission for the first salesman. Drag the formula uptoC11.

Q3. The following worksheet contains Name &Taxable Income for50employees.Calculate Income Tax Surcharge and Total Tax for the following worksheet

	A	B	C	D	E
1	NAME	TAXABLE INCOME	INCOME TAX	SURCHARGE	TOTAL TAX
2					
:					
:					
50					

Income Tax is calculated as follows:

Taxable Income	Income tax
First 1,50,000	Nil
Next 1,00,000	10%
Next 75,000	20%
Excess	30%

Surcharge is3% on Income Tax if Taxable income is above 5,00,000

Answer:

Enter headings and data as shown above

TocalculateINCOMETAX

In cell C2 enter the formula

=IF(B2<150000,0,IF(B2<=250000,(B2-150000)*10%,IF(B2<=325000,10000+(B2- 250000)*20%,25000+(B2-325000)*30%)))

And press enter key

It shows Income Tax for the

first employee Drag the formula

up to C51

To calculate SURCHARGE

In cell D2 enter the formula = IF (B2<500000, 0, C2*3%) and

press enter key It shows Surcharge for the first employee

Drag the formula up to D51

To calculate TOTALTAX

In cell E2 enter the formula = C2+D2 and

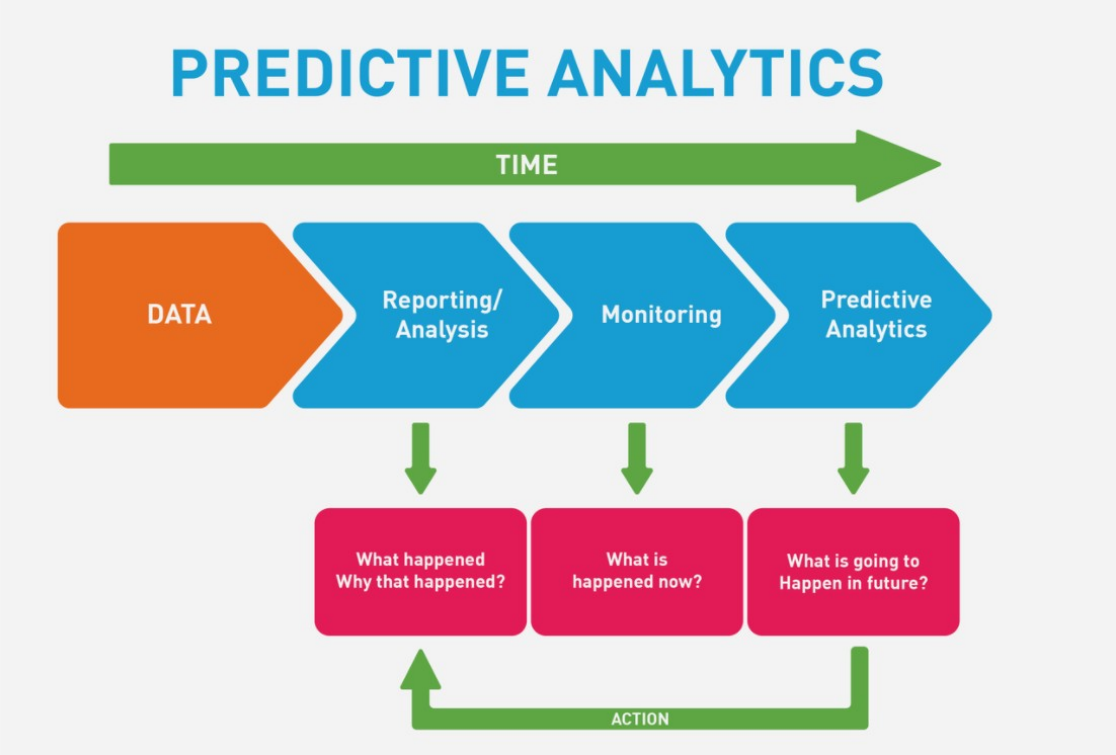
press enter key It shows Total Tax for the

first employee

Drag the formula up to E51

Predictive analytics

Predictive analytics in HR uses historical and current workforce data to forecast future outcomes, enabling proactive decision-making. This technology helps in areas like employee turnover, performance, and recruitment, offering a competitive advantage by reducing errors and improving processes.



Introduction to Predictive Analytics in HR:

Predictive analytics in HR involves applying statistical and machine learning techniques to analyze past and present employee data to predict future trends and outcomes. It moves beyond descriptive analytics, which focuses on what has already happened, to provide insights into what might happen in the future. This allows HR to anticipate challenges and opportunities, optimize strategies, and improve overall workforce management.

Key Examples of Predictive Analytics in HR:

- **Employee Turnover Prediction:**
  Analyzing factors like performance reviews, absenteeism, and tenure to identify employees at risk of leaving, enabling proactive retention efforts.
- **Performance Prediction:**
  Forecasting individual and team performance based on historical data and other relevant factors, allowing for targeted development and support.
- **Recruitment Optimization:**
  Identifying the most effective recruitment channels and candidate profiles based on past successful hires, improving the efficiency and effectiveness of the hiring process.
- **Workforce Planning:**
  Predicting future skill gaps and talent needs based on factors like retirement rates and market trends, enabling proactive workforce planning and development.
- **Engagement and Wellbeing:**
  Identifying factors that impact employee engagement and wellbeing, allowing for targeted interventions to improve the employee experience.
- **Succession Planning:**
  Identifying high-potential employees and predicting their readiness for leadership roles, facilitating effective succession planning.
- **Candidate Success Prediction:**

Assessing the likelihood of a candidate's success in a role based on various data points, improving hiring decisions.

Real-World Cases:

- **Experian:** Developed a predictive model to identify employees at risk of leaving, focusing on factors like growth opportunities and compensation.
- **HP:** Used predictive analytics to anticipate and prevent employee turnover.
- **Google:** Employed a prediction engine to forecast future outcomes related to employee performance and engagement.
- **Best Buy:** Utilized engagement data to predict business outcomes.
- **Nielsen:** Leveraged predictive analytics to assess the impact of various factors on business outcomes.

Benefits of Predictive Analytics in HR:

- **Reduced Turnover:**
  By identifying at-risk employees, HR can implement targeted retention strategies, reducing costly turnover.
- **Improved Performance:**
  Predictive analytics can help optimize performance management by identifying factors that drive performance and providing tailored support.
- **Enhanced Recruitment:**
  Streamlining recruitment processes, focusing on the most effective channels, and identifying the best candidates.
- **Better Workforce Planning:**
  Anticipating future skill gaps and proactively addressing them through training and development programs.
- **Data-Driven Decision Making:**
  Providing HR with the insights needed to make informed decisions, based on data rather than intuition.
- **Increased Efficiency:**
  By automating tasks and optimizing processes, predictive analytics can free up HR professionals to focus on strategic initiatives.
- **Improved Employee Experience:**
  By identifying factors that impact employee engagement and wellbeing, HR can create a more positive and fulfilling work environment.

Real-life Examples of Predictive Analytics in HR

The following predictive analysis HR examples show how companies have utilized predictive analytics in human resources:

Example 1: HP Predicting and Preventing Employee Turnover

In 2008, Hewlett-Packard discovered that its employees were leaving the company at an alarming rate. At first, the company thought the problem was due to poor management or employee dissatisfaction. But after conducting research, HP realized neither of these factors didn’t cause the pain. Instead, the issue was that HP had no way of predicting when employees would leave the company.

To solve this problem, HP developed a predictive analytics program called “Project Insight. ” Project Insight uses a combination of statistical modeling and text mining techniques to

predict future outcomes, including determining which employees will quit within the next six months. HP then sends emails to warn employees who are most likely to leave based on this data analysis.

This program has helped HP significantly decrease employee turnover rates. For example, between 2009 and 2011, the number of employees quitting per month decreased from 20% to less than 10%.

Example 2: Google's Prediction Engine To Predict Future Outcomes

Google is known for hiring top talent. The search engine giant employs thousands of new employees yearly, but only about 30% of them stay with the company for over two years. This means that Google loses millions of dollars yearly because it doesn't know which candidates will succeed until it is too late.

To address this problem, Google created a predictive analytics program called Google Prediction Engine. It analyzes job history, education, skills, and personality traits to determine how successful the applicants will become at Google. This information is vital to other HR leaders as well.

Based on this information, the system predicts whether an applicant will become a great employee. If the forecast is favorable, Google then offers the candidate a position. However, if the prediction is pessimistic, Google does not provide the person with a job.

This program has been very effective at reducing the number of unsuccessful applications. In fact, since 2007, Google has hired over 100,000 new employees using the Google Prediction Engine.

Example 3: BestBuy Predicting Business Outcome Using Engagement Numbers

Best Buy is one of America's largest electronics retailers. The company used a predictive analytics framework to identify customers who were unsatisfied with their purchases, improve customer service, and enhance business outcomes.

Using collected or existing data from online surveys, Best Buy determined that customers who purchased items like TVs, DVD players, and computers were likelier to complain about delivery delays, product defects, and unsatisfactory customer service.

How is predictive analytics used in HR?

Predictive analytics leverages historical data and statistical modeling to forecast future outcomes. This emerging technology is transforming how HR leaders approach talent management.

Specifically, predictive analytics enables organizations to:

- Forecast performance by analyzing past behaviors and results. HR can identify high-potential employees for development programs or succession planning.

- Predict turnover risk by examining engagement survey responses, absenteeism rates, and other warning signs. Proactive retention programs can then be implemented.

- Anticipate skills gaps by projecting hiring needs and comparing them to current capability levels. Skills development initiatives can up skill the workforce.

By leveraging predictive analytics, HR teams gain data-driven visibility into workforce risks and opportunities. This allows them to make smarter investments into their people.

HR analytics case studies

1. How a European shipping company used HR analytics to reduce absenteeism through job redesign

In 2020, a European shipping company struggled with persistently high absenteeism rates among its port-based security officers. Despite offering competitive market pay and revising employment contracts, attendance issues persisted. The roles were seen as transactional, with limited teamwork or purpose, leading to disengagement and high contractor reliance to cover absentee shifts.

With limited technology at their disposal, the HR team turned to basic yet effective people analytics methods:

- Job analysis to understand core tasks and pain points
- Focus groups with security officers to capture qualitative insights
- Excel-based tracking of absenteeism trends across multiple locations.

This triangulation revealed a clear pattern: the root cause of absenteeism wasn't compensation, it was poor job design and lack of role clarity.

The HR team redesigned the affected roles to increase clarity of responsibilities, foster better teamwork among officers, and reinforce their impact and purpose. No new software or complex systems were used, just structured listening, data interpretation, and role reengineering.

Within months of implementation, absenteeism decreased by 6%, contractor costs dropped by €350,000, and team morale and cohesion improved. This case study is covered in this book.

SIMPLE AND MULTIPLE LINEAR REGRESSION

Simple linear regression uses one independent variable to predict a dependent variable, while multiple linear regression uses two or more independent variables to predict a dependent variable. In essence, simple linear regression models a straight-line relationship between two variables, whereas multiple linear regression extends this to model relationships with several independent variables.

Here's a more detailed breakdown:

Simple Linear Regression:

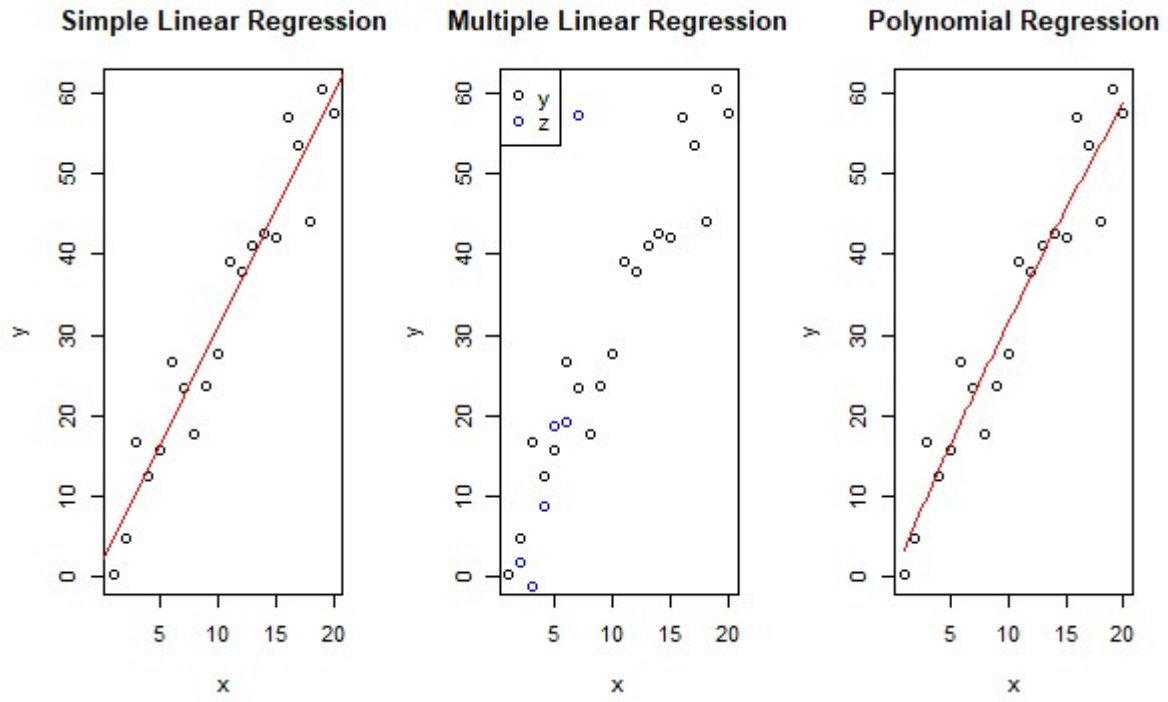
- **Focus:**
  Examines the relationship between a single independent variable (predictor) and a dependent variable (outcome).
- **Goal:**
  To find the best-fitting straight line that describes the relationship between the two variables.
- **Equation:**
  $y = b_0 + b_1x$, where y is the dependent variable, x is the independent variable, b_0 is the y-intercept, and b_1 is the slope.
- **Example:**
  Predicting a person's height based on their age (one independent variable).

Multiple Linear Regression:

- **Focus:**
  Examines the relationship between multiple independent variables and a single dependent variable.
- **Goal:**
  To determine how well the combination of independent variables predicts the dependent variable.
- **Equation:**
  $y = b_0 + b_1x_1 + b_2x_2 + ... + b□x□$, where y is the dependent variable, x_1, x_2, ... x□ are the independent variables, b_0 is the y-intercept, and b_1, b_2, ... b□ are the coefficients for each independent variable.
- **Example:**
  Predicting a person's salary based on their age, education level, and years of experience (multiple independent variables).

Key Differences:

- **Number of Independent Variables:**
  Simple linear regression uses one, while multiple linear regression uses two or more.
- **Model Complexity:**
  Multiple regression is more complex as it considers the combined effect of multiple predictors on the outcome.
- **Interpretation:**
  In multiple regressions, the coefficients (b_1, b_2, etc.) represent the change in the dependent variable for a one-unit change in the corresponding independent variable, holding all other independent variables constant.



Prescriptive analytics

Prescriptive analytics, in the context of Human Resources (HR), is a sophisticated form of data analysis that goes beyond simply identifying trends or predicting future outcomes. It focuses on providing specific, actionable recommendations to optimize HR processes and achieve desired business results. Essentially, it uses data to determine the best course of action for various HR challenges, such as recruitment, retention, and performance management.

Introduction to Prescriptive Analytics:

Prescriptive analytics leverages descriptive and predictive analytics to recommend specific actions. It uses a combination of business rules, heuristics, and algorithms to simulate different strategies and suggest the optimal path. By analyzing data and considering various factors, it helps HR professionals make proactive, data-driven decisions.

Examples of Prescriptive Analytics in HR:

- **Retention Strategies:**
  Prescriptive analytics can analyze employee data (e.g., performance reviews, engagement scores, exit interviews) to identify factors contributing to employee turnover. It can then recommend specific interventions, such as launching wellness programs, offering mentorship opportunities, or adjusting compensation packages, to improve retention rates.
- **Recruitment Strategies:**
  By analyzing data on successful hires, prescriptive analytics can identify optimal recruitment channels, candidate profiles, and interview strategies. This can lead to more efficient and effective recruitment processes, reducing time-to-hire and improving offer acceptance rates.
- **Diversity and Inclusion Initiatives:**
  Prescriptive analytics can help organizations choose the most impactful diversity and inclusion initiatives by analyzing their potential impact on retention, bias reduction, and overall workplace culture.
- **Internal Mobility Tactics:**

It can analyze employee skills, performance, and career aspirations to identify opportunities for lateral or vertical movement within the organization. This can help reduce employee turnover costs and improve employee engagement.

- **Staffing Needs:**
  Prescriptive analytics can analyze employee interactions with digital benefit options and predict potential staffing needs based on anticipated retirements, leaves of absence, or other factors.
- **Attrition Prevention:**
  By analyzing factors preceding employee departures, prescriptive analytics can help organizations proactively address issues that might lead to attrition, such as changes in management, lack of training, or inadequate support.
  Cases of HR Prescriptive Analytics:
- **Experian:**
  This multinational credit institution uses machine learning to track and prevent employee attrition. They analyze employee behaviors preceding departures and use that data to recommend interventions like adjusting team structures or offering additional training.
- **Leading HR Organizations:**
  Many organizations are implementing prescriptive analytics to streamline HR processes, improve decision-making, and drive better business outcomes.
  Key Benefits of Prescriptive Analytics in HR:
- **Improved Decision-Making:**
  Data-driven recommendations help HR professionals make more informed and effective decisions.
- **Increased Efficiency:**
  Prescriptive analytics can streamline HR processes, reducing manual effort and improving overall efficiency.
- **Reduced Costs:**
  By optimizing recruitment, retention, and other HR processes, prescriptive analytics can help organizations reduce costs associated with hiring, training, and employee turnover.
- **Enhanced Employee Experience:**
  By identifying and addressing employee needs proactively, prescriptive analytics can contribute to a more positive and engaging employee experience.
  In essence, prescriptive analytics empowers HR to move beyond reactive responses to proactive, data-driven strategies, ultimately contributing to a more efficient, effective, and engaged workforce.
  HR professionals likely agree that making data-driven workforce decisions is critical, yet challenging.
  Leveraging **prescriptive analytics** in HR unlocks the ability to optimize human capital management through predictive insights and recommended actions.

  In this post, we'll explore key applications of prescriptive HR analytics for strategic planning, including enhancing HR solutions, workforce optimization, talent management, and more.

  Introduction to Prescriptive Analytics in HR

  Prescriptive analytics is the next evolution of workforce analytics, leveraging AI and advanced algorithms to provide data-driven recommendations on the optimal actions HR can take to achieve strategic talent management goals.

  Defining Prescriptive Analytics in HR

Prescriptive analytics moves beyond descriptive analytics (reporting historical metrics) and predictive analytics (forecasting future outcomes) to advise on the best steps forward based on data insights. It examines multiple future scenarios to recommend concrete ways to optimize business objectives around managing human capital.

Contrasting Other Types of HR Analytics

- **Descriptive analytics** focuses on *"what happened"* by tracking and benchmarking HR metrics like turnover, retention, hiring velocity, etc.
- **Predictive analytics** looks ahead at *"what could happen"* by forecasting outcomes like which employees are likely to quit or who would be a good cultural fit.
- **Prescriptive analytics** takes the next step to recommend *"how to make improvements"* by providing data-backed suggestions to proactively enhance productivity, engagement, diversity, alignment, etc.

The Importance of Prescriptive Analytics in HR

Adopting prescriptive analytics enables HR to become a more strategic function, using workforce intelligence to advise business leaders on talent optimization decisions. Key benefits include:

- Transitioning from reactive to **proactive talent management**
- Leveraging AI and algorithms for **data-driven recommendations**
- Simulating multiple futures to **model business impact** of HR initiatives
- Optimizing processes to **enhance productivity** and **alignment**

With prescriptive insights, HR has an invaluable opportunity to elevate its strategic influence and advance organizational objectives through people.

How is prescriptive analytics used in HR?

Prescriptive analytics provides actionable recommendations to help HR professionals optimize decisions and outcomes. Here are some key ways prescriptive analytics can be applied in human resources:

Strategic Workforce Planning

Prescriptive analytics models can forecast hiring needs, skill gaps, and turnover rates. This enables data-driven workforce planning to have the right talent in place. Models may recommend optimal hiring targets, reskilling programs, and retention incentives.

Talent Acquisition

Analytics can prescribe optimal job posting locations, screening criteria, interview practices, and offer packages for landing top candidates quickly. Models can even suggest sources to tap for passive candidates.

Learning and Development

Prescriptive analytics can suggest personalized training programs based on skill gaps and career goals. Models can also recommend methods and incentives most likely to motivate participation and completion.

Performance Management

Analytics models can propose evidence-based performance measures tailored to specific roles. Dashboards with prescribed KPIs help managers track progress. Models also suggest coaching plans to boost productivity.

Retention and Engagement

By analyzing factors driving attrition, models can recommend retention incentives that are likely to have the biggest impact for at-risk employees. Analytics can also propose drivers of engagement to focus on.

In summary, prescriptive analytics transforms HR from gut feel to data-driven decisions. The right recommendations lead to measurable gains in workforce excellence and business performance.

what if analysis and its types

What-if analysis is a decision-making process that explores the impact of changing input variables on the outcome of a model or situation. It helps businesses and individuals understand potential risks and opportunities by examining various scenarios. In Excel, What-If Analysis is facilitated by three main tools: Scenarios, Goal Seek, and Data Tables.

This video explains how to use the Data Table function in Excel to analyze different investment scenarios:

3s

Leila Gharani
YouTube · 1 Dec 2022

Types of What-If Analysis:

1. **1. Scenarios:**
   Scenarios involve defining different sets of input values and saving them as named scenarios. This allows users to switch between these scenarios to see how they affect the output. For example, a business might create scenarios for high, medium, and low sales growth to understand the potential impact on revenue and profitability.
2. **2. Goal Seek:**
   Goal Seek is used when you know the desired outcome (goal) and need to find the input value that will achieve it. It works backward by adjusting one input variable until the formula produces the desired result. For instance, if you know the desired profit margin, Goal Seek can help determine the required sales price.
3. **3. Data Tables:**
   Data tables are used to automate the process of calculating results for different input values. They can handle one or two changing input variables and display the results in a

table format. For example, a data table can show how changes in interest rates affect loan payments.

Other What-If Analysis Techniques:

While Excel provides these three tools, other techniques can also be used for what-if analysis:

1. **1. Sensitivity Analysis:**
   This method explores the impact of changes in a single input variable on the output, while holding other variables constant. It helps identify which inputs have the most significant influence on the outcome.
2. **2. Monte Carlo Simulation:**
   This technique uses random sampling to generate a large number of possible scenarios based on probability distributions for the input variables. It provides a more comprehensive understanding of the range of potential outcomes and their likelihood.

Scenario Manager

The scenario manager is a tool in Excel (a built-in feature, not an add-in) that allows users to perform "what-if" analysis by creating and managing multiple sets of input values (scenarios) within a worksheet. It enables users to explore different potential outcomes based on varying input conditions and compare them side-by-side.

Here's a more detailed breakdown:

What it does:

- **Stores Multiple Scenarios:**
  It allows you to define and save different sets of input values (scenarios) in the same worksheet.
- **"What-if" Analysis:**
  By switching between scenarios, you can see how changes in input values affect the overall results.
- **Decision Making:**
  This helps in making informed decisions by analyzing the potential impact of different scenarios.

How to use it:

1. **Access:** Navigate to the "Data" tab in Excel and find the "What-If Analysis" group.
2. **Create Scenarios:** Define input values (changing cells) and assign a name to each scenario.
3. **Switch Between Scenarios:** Select a scenario and click "Show" to apply those values to the worksheet.
4. **Create Summary Reports:** You can create a summary report that compiles data from all your defined scenarios.

Example:

A company might use the scenario manager to analyze the impact of different sales projections (low, medium, high) on their budget. They can define each sales projection as a separate scenario and see how it affects their overall financial picture.

Key Benefits:

- **Data Comparison:** Easily compare different scenarios side-by-side.
- **Informed Decisions:** Helps in making better decisions by understanding the potential outcomes of various situations.
- **Collaboration:** Scenario manager can be used to collect information from different workbooks and merge them into one.
- **Flexibility:** You can modify scenarios and even export them as documentation.

A scenario is a set of input values that you can substitute in a worksheet to perform what-if analysis. For example, you could create scenarios to show various interest rates, loan

amounts, and terms for a mortgage. Excel's scenario manager lets you create and store different scenarios in the same worksheet.

Use Scenario Manager

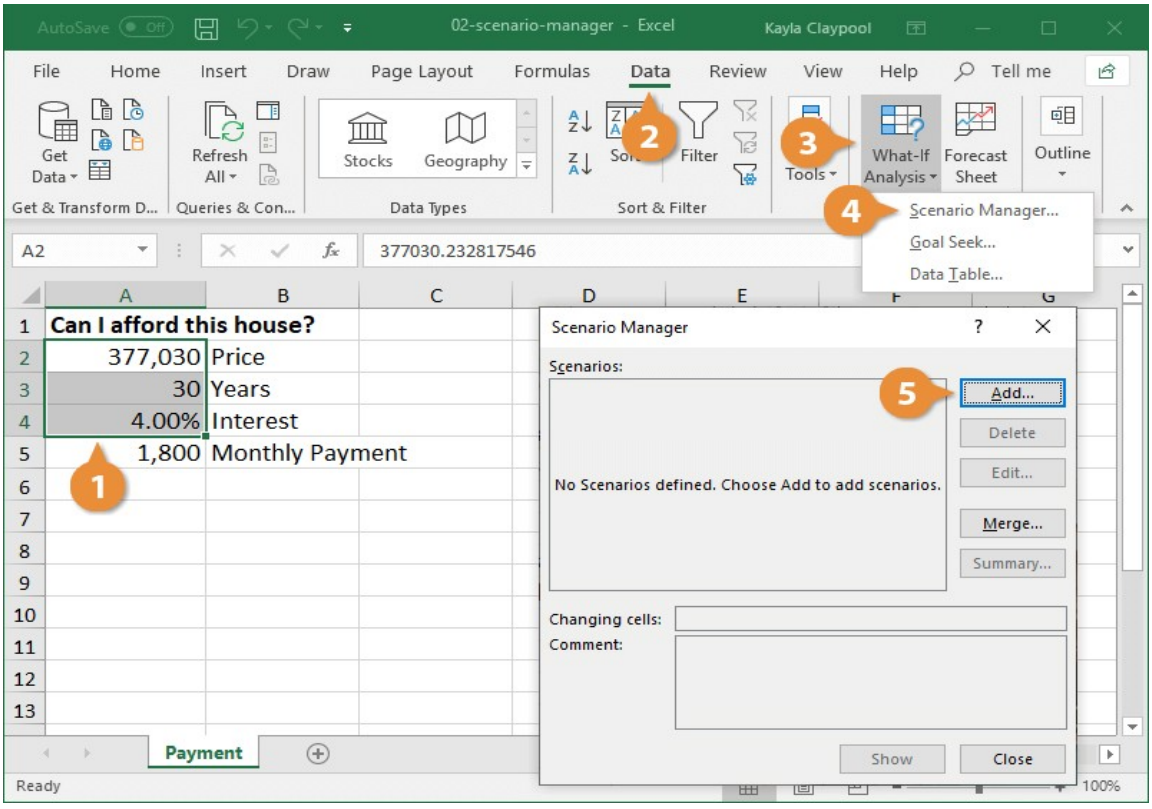
1. Select the cells that contain values that could change.
2. Click the Data tab on the ribbon.
3. Click the What-If Analysis button.
4. Select Scenario Manager. ...
5. Click the Add button to add a new scenario.
6. Type a name for the new scenario. ...
7. Click OK. ...
8. Update any values you want to see for the given scenario.

Use Scenario Manager

1. Select the cells that contain values that could change.
2. Click the **Data** tab on the ribbon.
3. Click the **What-If Analysis** button.
4. Select **Scenario Manager**.

The Scenario Manager dialog box appears with the message "No Scenarios defined. Choose Add to add scenarios.

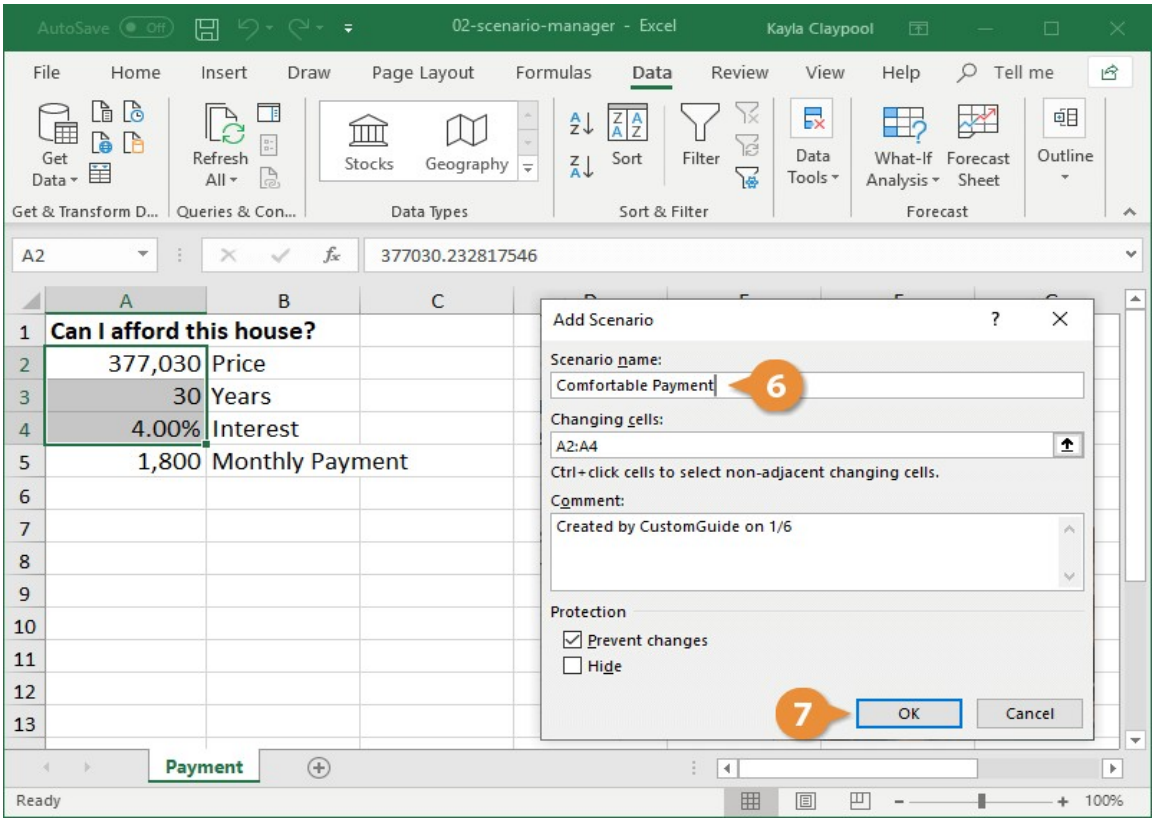
1.Click the **Add** button to add a new scenario.



2.Type a name for the new scenario.

If you already have cells selected, the Changing cells field will already be populated with your selection. If you didn't select cells up front, you'll have to specify the cells here.

3.Click **OK**.



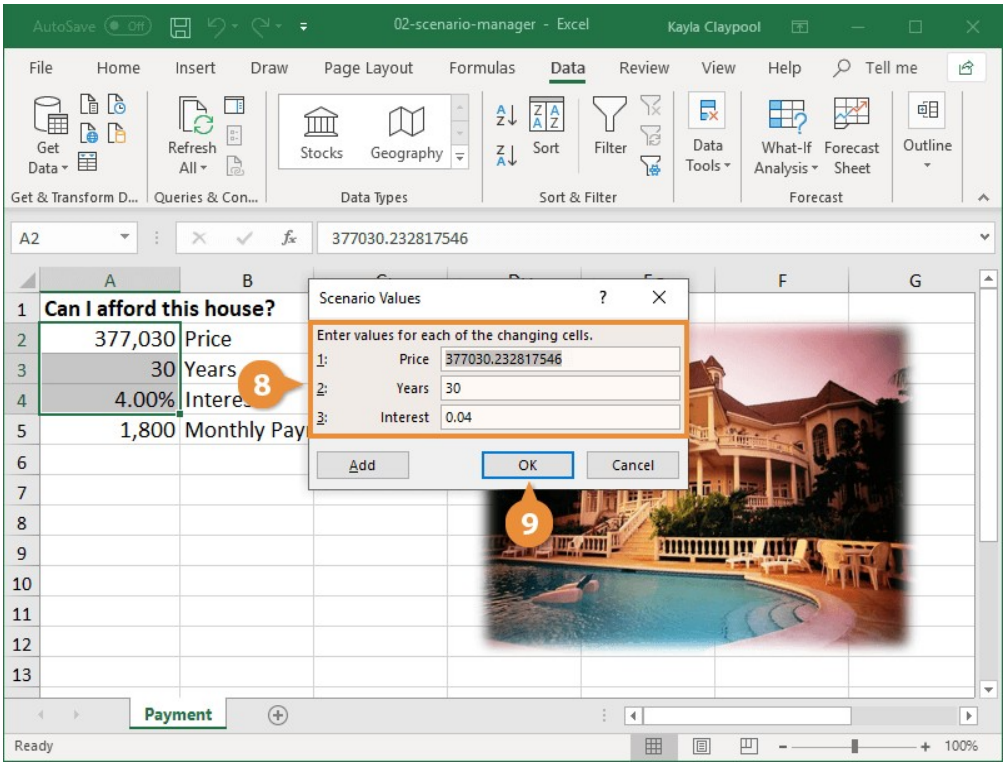
The Scenario Values dialog box appears, showing each of the variable cells you selected.

If you name the worksheet cells you're changing, the cell names appear here, making it easy to tell what value you're working with.

4.Update any values you want to see for the given scenario.

To make sure you don’t lose the original values for the changing cells, use the original cell values in the first scenario you create.

5.Click **OK**.

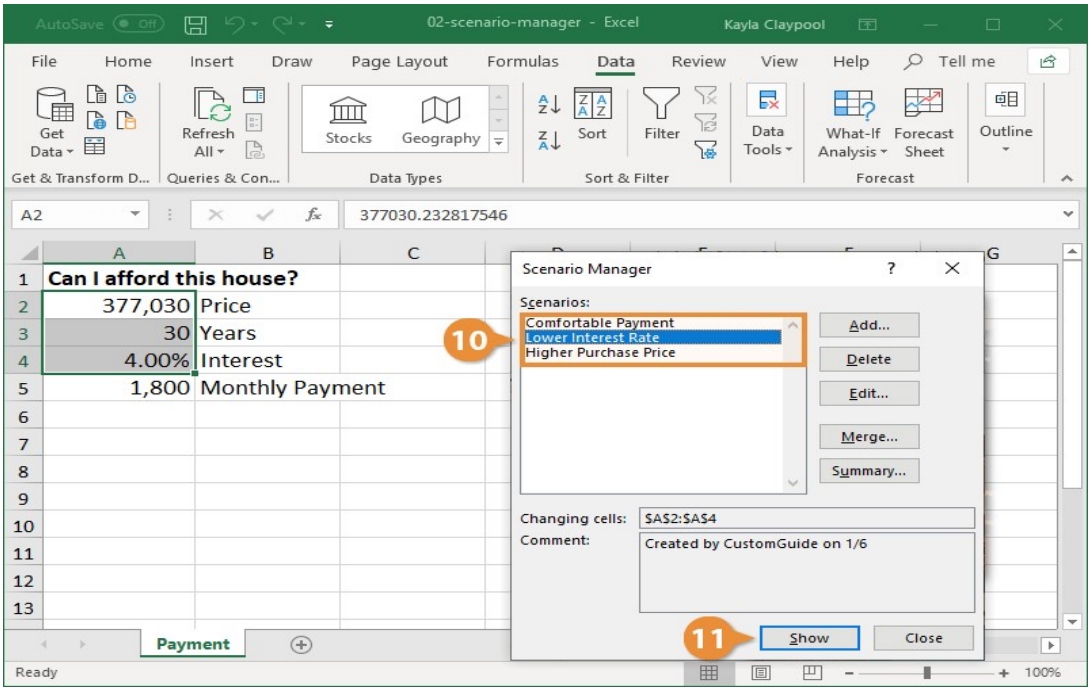


The scenario is added and is listed in the Scenario Manager. If you click Add, the Add Scenario dialog box appears again so you can add another scenario.

Repeat steps 5-9 to add all the desired scenarios.

6.Select the scenario you want to view.

7.Click the **Show** button.



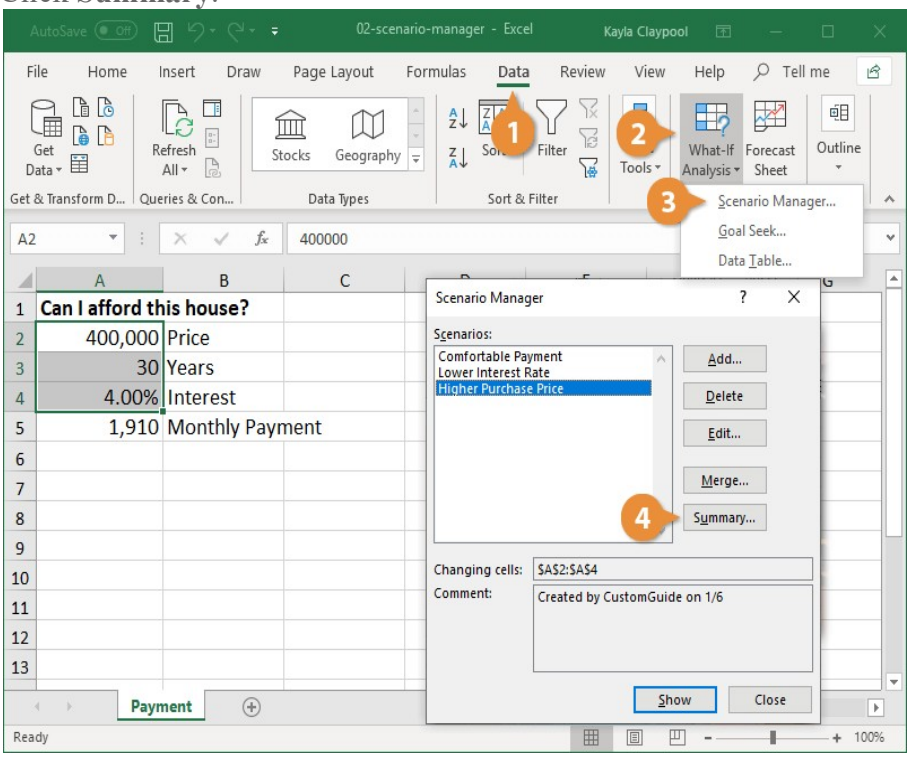
The worksheet's values are changed to the values you specified in the scenario. You can select any scenario here to update the values in your spreadsheet.

View a Scenario Summary

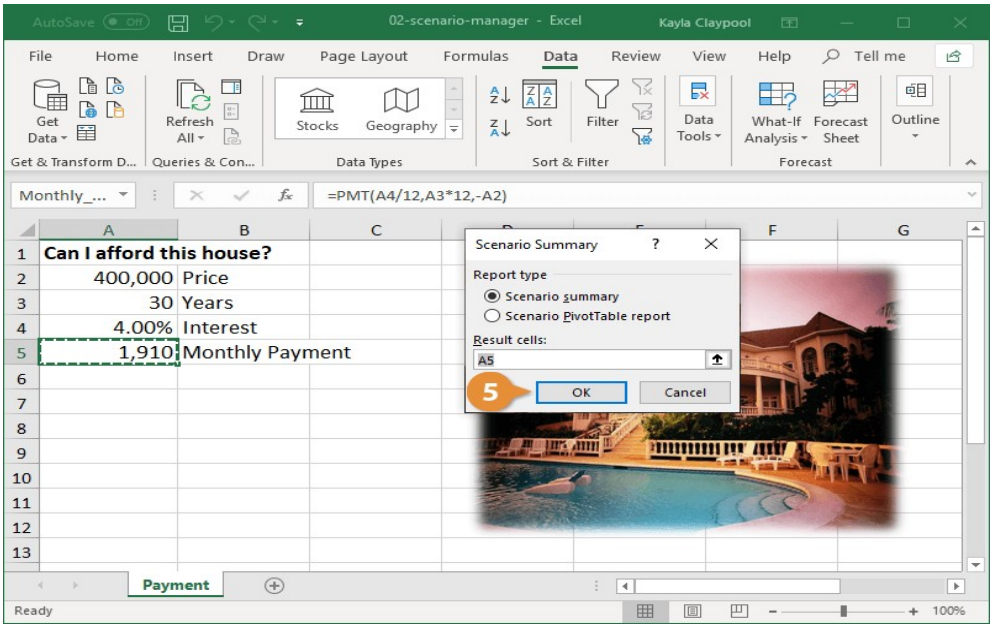
A scenario summary report is a single compiled report that summarizes the results from several scenarios. It's easier to read than switching between different scenarios. Once you've created at least two scenarios, you can create a summary report.

1. Click the **Data** tab.
2. Click the **What-If Analysis** button.
3. Select **Scenario Manager**.

   The Scenario Manager dialog box appears, displaying all the scenarios you've created.
4. Click **Summary**.



   The Scenario Summary dialog box appears. Ensure the Scenario summary option is selected.
5. Click **OK**.



A summary report for each scenario is generated on a separate sheet so you can compare each one side by side.

Goal seek and Data tables in Excel

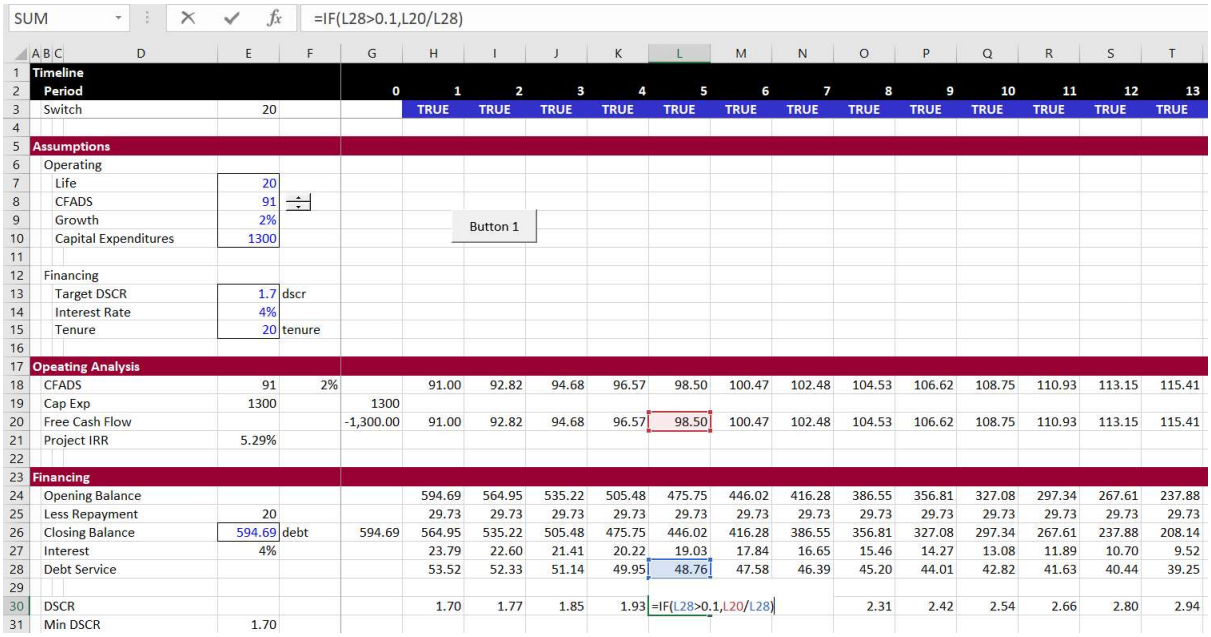
Goal-seek is distinctly different, it uses a single result and calculates possible input values that would produce that result. Like scenarios, data tables help you explore a set of possible outcomes. Unlike scenarios, data tables show you all the outcomes in one table on one worksheet.

Data Tables & Goal Seek

This page demonstrates how to create a one-way and a two way data table using VBA where the result of each scenario depends on a goal seek. The data table does not realise that it is supposed to run a goal seek each time a new result is put into the table. Using VBA code allows you to evaluate different scenarios and present scenario tables in different formats where the final results require a goal seek function. This webpage includes discussion of the VBA code with a FOR/NEXT function and the CELLS function. A project finance model where the debt size is established with a goal seek function driven by the target DSCR is used as an example. The example is used to illustrate basics of creating a VBA program.

The file that is used in explaining how to create the data table with the goal seek is included in the spreadsheet that you can download by pressing the button below. This file includes a very simple project finance model where the size of the debt depends on an input debt service coverage ratio (DSCR). As the repayment of debt is assumed to be very simple with a flat repayment, a simple mathematical formula cannot be used. Instead the debt amount can be computed by achieving the target DSCR with a goal seek formula. The file below includes three macros. The first is a basic one line goal seek macro. The second is a simple one way data table without flexible row and column ranges. The third is a two-way data table that can be moved with flexible row and columns.

The first screenshot shows a simple project finance model that is used to demonstrate the VBA code. A simple project finance model is created where the debt size is set from an input DSCR. In the analysis, a time line, operating cash flow and a debt schedule is established. Note that the repayment on row 25 is flat and the period by period DSCR on line 30 increases by each period. In the case shown in the screenshot the goal seek has been run and the target goal seek equals the modelled.



					0	1	2	3	4	5	6	7	8	9	10	11	12	13
Timeline																		
Period																		
Switch	20				TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Assumptions																		
Operating																		
Life	20																	
CFADS	91																	
Growth	2%																	
Capital Expenditures	1300																	
Financing																		
Target DSCR	1.7	dscr																
Interest Rate	4%																	
Tenure	20	tenure																
Opeating Analysis																		
CFADS	91	2%			91.00	92.82	94.68	96.57	98.50	100.47	102.48	104.53	106.62	108.75	110.93	113.15	115.41	
Cap Exp	1300		1300															
Free Cash Flow			-1,300.00		91.00	92.82	94.68	96.57	98.50	100.47	102.48	104.53	106.62	108.75	110.93	113.15	115.41	
Project IRR	5.29%																	
Financing																		
Opening Balance					594.69	564.95	535.22	505.48	475.75	446.02	416.28	386.55	356.81	327.08	297.34	267.61	237.88	
Less Repayment	20				29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	29.73	
Closing Balance	594.69	debt	594.69		564.95	535.22	505.48	475.75	446.02	416.28	386.55	356.81	327.08	297.34	267.61	237.88	208.14	
Interest	4%				23.79	22.60	21.41	20.22	19.03	17.84	16.65	15.46	14.27	13.08	11.89	10.70	9.52	
Debt Service					53.52	52.33	51.14	49.95	48.76	47.58	46.39	45.20	44.01	42.82	41.63	40.44	39.25	
DSCR					1.70	1.77	1.85	1.93	=IF(L28>0.1,L20/L28)			2.31	2.42	2.54	2.66	2.80	2.94	
Min DSCR	1.70																	

The insert below is the macro for creating a simple goal seek. You just turn your record button on and then record the macro. Then you should use range names for the target (in the case below defined as dif) and the input cell that is changed. Make sure the input has no formula — not even something like =5. If you are trying to make a goal seek for IRR, it is much better to use the NPV at the target IRR as the target cell with the formula. If you want to make a goal seek with dynamic goal seeks you can create a user defined function — see the excel section.

.

```
Sub goalseek()
'
' goalseek Macro
'
Range("dif").goalseek Goal:=0, ChangingCell:=Range("debt")
End Sub


.
```

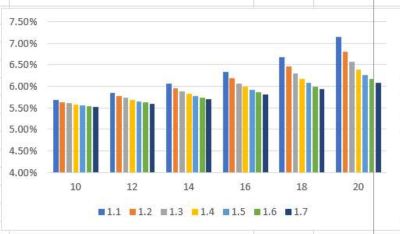
The screenshot below shows illustrates the results of the goal seek. The button is attached to the macro with the goal seeks shown below. If you are starting I suggest that you first try a one way table as illustrated below. You then only have to make one loop around the rows.

```
.
.
Sub oneway()
For Row = 41 To 47
   Range("dscr") = Cells(Row, 9)
   goalseek
   Cells(Row, 10) = Range("eqirr")
Next Row
End Sub
```

	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	**Timeline**															
2	**Period**			**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
3	Switch	20			TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
28	Debt Service				53.52	52.33	51.14	49.95	48.76	47.58	46.39	45.20	44.01	42.82	41.63	40.44
29																
30	DSCR				1.70	1.77	1.85	1.93	2.02	2.11	2.21	2.31	2.42	2.54	2.66	2.80
31	Min DSCR	1.70														
32	Target DSCR	1.70														
33	Difference	0.00	Dif													
34																
35	Equity Cash Flow			-705.31	37.48	40.49	43.53	46.62	49.74	52.90	56.10	59.33	62.61	65.94	69.30	72.71
36	Equity IRR	6.08%	eqirr													
37																
38																
39																
40						DSCR	Equity IRR									
41						1.1	9.65%				One Way					
42						1.2	9.36%									
43						1.3	9.14%									
44						1.4	8.96%									
45						1.5	8.82%									
46						1.6	8.71%									
47						1.7	8.61%									

The next screenshot illustrates how you can create a two-way table that changes both the tenure of the debt and the DSCR. Note that when you change two variables there is an interaction. To create this table you need two loops. One loop around the rows and the second loop around the columns.

	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	**Timeline**															
2	**Period**			**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
3	Switch	20			TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
48																
49					CFADS	91		Two Way								
50																
51									Tenure							
52							10	12	14	16	18	20				
53						1.1	5.68%	5.85%	6.06%	6.33%	6.69%	7.15%		startrow	53	
54						1.2	5.64%	5.78%	5.96%	6.18%	6.46%	6.81%		endrow	59	
55					DSCR	1.3	5.60%	5.73%	5.88%	6.07%	6.30%	6.57%		startcol	10	
56						1.4	5.58%	5.69%	5.82%	5.98%	6.17%	6.40%		endcol	15	
57						1.5	5.55%	5.65%	5.77%	5.91%	6.08%	6.27%				
58						1.6	5.53%	5.63%	5.73%	5.86%	6.00%	6.16%				
59						1.7	5.52%	5.60%	5.70%	5.81%	5.94%	6.08%				



.

```
Sub twoway()
For Row = Range("startrow") To Range("endrow")
   Range("dscr") = Cells(Row, Range("startcol") - 1)
   For Column = Range("startcol") To Range("endcol")
      Range("tenure") = Cells(Range("startrow") - 1, Column)
      goalseek
      Cells(Row, Column) = Range("eqirr")
    Next Column
Next Row
End Sub
```

Data intro and Running and Interpretation

Data introduction involves understanding the nature and source of information, while data interpretation is the process of making sense of that data to draw meaningful conclusions. Running data refers to the process of executing calculations, analyses, or

simulations using the collected data. Interpretation then involves explaining the results of this "running" to understand the implications and patterns.

1. Data Introduction:

- **Definition:**
  Data is a collection of facts, figures, numbers, or descriptions that represent something. It can be raw, unorganized, and unstructured.
- **Purpose:**
  Understanding the source and type of data is crucial before analysis. This includes identifying the origin of the data, its format (e.g., numerical, textual, categorical), and its potential limitations.
- **Example:**
  If analyzing sales data, understanding if the data is from online or physical stores, the time period it covers, and the different product categories is part of the data introduction.

2. Running Data:

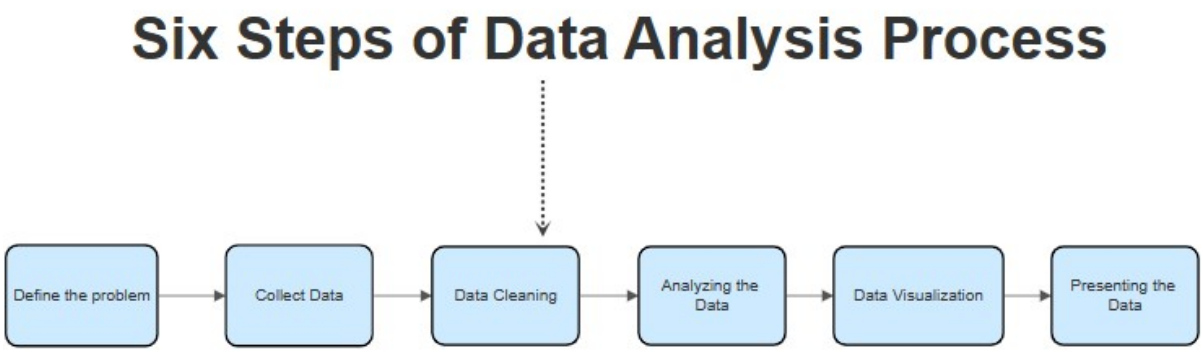
- **Definition:**
  "Running data" refers to the practical application of data analysis techniques. This could involve calculations, statistical analysis, or running simulations.
- **Purpose:**
  To apply specific methods to the data in order to extract insights and identify patterns.
- **Example:**
  Using a spreadsheet program to calculate average sales, or using statistical software to perform regression analysis on marketing campaign data.

3. Interpretation of Data:

- **Definition:**
  Data interpretation is the process of making sense of the results obtained from running the data analysis.
- **Purpose:**
  To explain the patterns, trends, and relationships found in the data and draw meaningful conclusions.
- **Example:**
  If a regression analysis shows a strong positive correlation between advertising spending and sales, the interpretation would explain the relationship and its implications for future marketing strategies.
- **Key aspects:**
- **Identifying patterns:** Finding recurring themes or trends in the data.
- **Drawing conclusions:** Forming logical statements based on the observed patterns.
- **Making recommendations:** Suggesting actions or further investigations based on the conclusions.

  In essence, data introduction sets the stage, "running" the data performs the analysis, and data interpretation explains the results.

Steps for Data Analysis Process



1. Define the Problem or Research Question
2. Collect Data
3. Data Cleaning
4. Analyzing the Data
5. Data Visualization
6. Presenting Data

Each step has its own process and tools to make overall conclusions based on the data.

Step 1. Define the Problem or Research Question

In the first step of process the data analyst is given a problem/business task. The analyst has to understand the task and the stakeholder's expectations for the solution. A stakeholder is a person that has invested their money and resources to a project. The analyst must be able to ask different questions in order to find the right solution to their problem. The analyst has to find the root cause of the problem in order to fully understand the problem. The analyst must make sure that he/she doesn't have any distractions while analyzing the problem. Communicate effectively with the stakeholders and other colleagues to completely understand what the underlying problem is. Questions to ask yourself for the Ask phase are:

- What are the problems that are being mentioned by my stakeholders?
- What are their expectations for the solutions?

Step 2. Data Collection

The second step is to **Prepare or Collect the Data.** This step includes collecting data and storing it for further analysis. The analyst has to collect the data based on the task given from multiple sources. The data has to be collected from various sources, internal or external sources.

Internal data is the data available in the organization that you work for while external data is the data available in sources other than your organization.

- The data that is collected by an individual from their own resources is called first-party data.
- The data that is collected and sold is called second-party data.
- Data that is collected from outside sources is called third-party data.

The common sources from where the data is collected are Interviews, Surveys, Feedback, Questionnaires. The collected data can be stored in a spreadsheet or SQL database.

Step 3. Data Cleaning

The third step is **Clean and Process Data**. After the data is collected from multiple sources, it is time to **clean** the data. Clean data means data that is free from misspellings, redundancies, and irrelevance. Clean data largely depends on data integrity.

- There might be duplicate data or the data might not be in a format, therefore the unnecessary data is removed and cleaned.
- There are different functions provided by SQL and Excel to clean the data.

This is one of the most important steps in Data Analysis as clean and formatted data helps in finding trends and solutions. The most important part of the Process phase is to check whether your data is biased or not. Bias is an act of favoring a particular group/community while ignoring the rest. Biasing is a big no-no as it might affect the overall data analysis. The data analyst must make sure to include every group while the data is being collected.

Step 4. Analyzing the Data

The fourth step is to **Analyze**. The cleaned data is used for analyzing and identifying trends. It also performs calculations and combines data for better results. The tools used for performing calculations are Excel or SQL. These tools provide in-built functions to perform calculations or sample code is written in SQL to perform calculations.
Using Excel, we can create pivot tables and perform calculations while SQL creates temporary tables to perform calculations.
Programming languages are another way of solving problems. They make it much easier to solve problems by providing packages. The most widely used programming languages for data analysis are R and Python.

Step 5. Data Visualization

The **fifth step is visualizing the data**. Nothing is more compelling than a visualization. The data now transformed has to be made into a visual (chart, graph). The reason for making data visualizations is that there might be people, mostly stakeholders that are non-technical. Visualizations are made for a simple understanding of complex data.

- Tableau and Looker are the two popular tools used for compelling data visualizations. Tableau is a simple drag and drop tool that helps in creating compelling visualizations.
- Looker is a data viz tool that directly connects to the database and creates visualizations.

Tableau and Looker are both equally used by data analysts for creating a visualization. R and Python have some packages that provide beautiful data visualizations. R has a package named ggplot which has a variety of data visualizations. A presentation is given based on the data findings. Sharing the insights with the team members and stakeholders will help in making better decisions. It helps in making more informed decisions and it leads to better outcomes.

Step 6. Presenting the Data

Presenting the data involves transforming raw information into a format that is easily comprehensible and meaningful for various stakeholders. This process encompasses the creation of visual representations, such as charts, graphs, and tables, to effectively communicate patterns, trends, and insights gleaned from the data analysis.
The goal is to facilitate a clear understanding of complex information, making it accessible to both technical and non-technical audiences. Effective data presentation involves

thoughtful selection of visualization techniques based on the nature of the data and the specific message intended. It goes beyond mere display to storytelling, where the presenter interprets the findings, emphasizes key points, and guides the audience through the narrative that the data unfolds.

Whether through reports, presentations, or interactive dashboards, the art of presenting data involves balancing simplicity with depth, ensuring that the audience can easily grasp the significance of the information presented and use it for informed decision-making.

Dashboard Creation and HR Analytics Reporting

HR analytics reporting and dashboard creation are vital for data-driven HR management. HR dashboards visually represent key performance indicators (KPIs) related to workforce management, allowing for quick insights into trends and performance. These dashboards can be used to track recruitment, retention, performance, and development metrics, among others. Effective dashboard creation involves defining the audience, identifying relevant HR KPIs, choosing a platform, building the dashboard, and setting permissions.

Key Aspects of HR Analytics Reporting and Dashboard Creation:

- **Defining the Audience and Objectives:**
  Understanding who will use the dashboard and what they need to achieve is crucial. For example, a director might need a high-level overview of ongoing initiatives, while a manager might need a dashboard focused on team performance.
- **Identifying HR KPIs:**
  Select KPIs that align with the defined objectives. Common HR KPIs include employee count, turnover rate, cost per hire, training costs, and absenteeism rate.
- **Choosing a Platform:**
  Many HR platforms offer built-in dashboard capabilities. Excel can also be used for basic dashboards.
- **Building the Dashboard:**
  This involves selecting appropriate visualizations (charts, graphs, tables) and arranging them logically on the dashboard.
- **Setting Permissions:**
  Control access to the dashboard to ensure data security and appropriate user access.
- **Data Analysis:**
  Dashboards are a tool for displaying data, but it's essential to analyze the data behind the visualizations to understand trends and make informed decisions.
- **Types of HR Analytics:**
- **Descriptive Analytics:** Focuses on summarizing past data (e.g., calculating turnover rate).
- **Diagnostic Analytics:** Investigates the reasons behind trends (e.g., why turnover is high).
- **Predictive Analytics:** Uses historical data to forecast future outcomes (e.g., predicting future turnover based on current trends).
- **Prescriptive Analytics:** Suggests actions to take based on predictions (e.g., recommending specific interventions to reduce turnover).

  HR Scorecards:

  HR scorecards are strategic management tools that measure the effectiveness of HR functions in achieving business goals, using key HR metrics and indicators.

  Benefits of HR Dashboards:
- **Improved Decision-Making:**
  Dashboards provide quick access to key data, enabling HR professionals to make more informed decisions.
- **Enhanced Efficiency:**
  By automating data collection and reporting, dashboards save time and effort.
- **Better Alignment with Business Goals:**

Dashboards can track metrics that are directly linked to business outcomes, ensuring HR initiatives are aligned with overall organizational goals.

- **Increased Transparency and Accountability:**
  Dashboards make HR data readily available, promoting transparency and accountability within the organization.
- **Proactive Problem Solving:**
  Dashboards can help identify potential problems early on, allowing for proactive interventions.
  Examples of HR Dashboards:
  - **Recruitment Dashboard:** Tracks metrics like time-to-fill, cost-per-hire, and candidate sources.
  - **Retention Dashboard:** Monitors turnover rates, employee engagement, and reasons for leaving.
  - **Performance Management Dashboard:** Tracks performance ratings, employee development, and training completion.
  - **Diversity and Inclusion Dashboard:** Monitors workforce demographics and diversity metrics.
  - **Compensation and Benefits Dashboard:** Tracks salary trends, benefits utilization, and cost of compensation.

  By leveraging HR analytics reporting and dashboard creation, organizations can gain valuable insights into their workforce, improve decision-making, and ultimately enhance their overall business performance.

  For example, an HR dashboard might display a real-time view of employee turnover trends using an interactive chart that updates automatically. Meanwhile, an HR report might provide a detailed analysis of turnover data for the past quarter, including narrative insights and static tables.

  Dashboard creation involves defining objectives, understanding the audience, gathering and preparing data, designing the layout, choosing tools, developing, testing, and maintaining. It's a process that can be applied to various platforms, from spreadsheets to dedicated dashboarding tools.
  1. Define Objectives and Audience:
  - **Objectives:**
    Clearly identify what you want to achieve with the dashboard. What key performance indicators (KPIs) will be tracked? PLANEKS says
  - **Audience:**
    Understand who will be using the dashboard and what information they need. Consider their technical skills and level of access.

    2. Data Preparation:
  - **Data Sources:** Identify where the data resides (databases, spreadsheets, etc.).
  - **Data Cleaning and Transformation:** Ensure data is accurate, consistent, and in a usable format.
  - **Data Modeling:** Organize data for efficient querying and analysis.

    3. Dashboard Design:
  - **Layout:** Plan the placement of visualizations (charts, graphs, tables) for optimal clarity and flow. according to GoodData
  - **Visualizations:** Choose appropriate chart types to represent data effectively.

- **Interactivity:** Consider adding features like filters, drill-downs, and tooltips to enhance user experience.

4. Tool Selection:

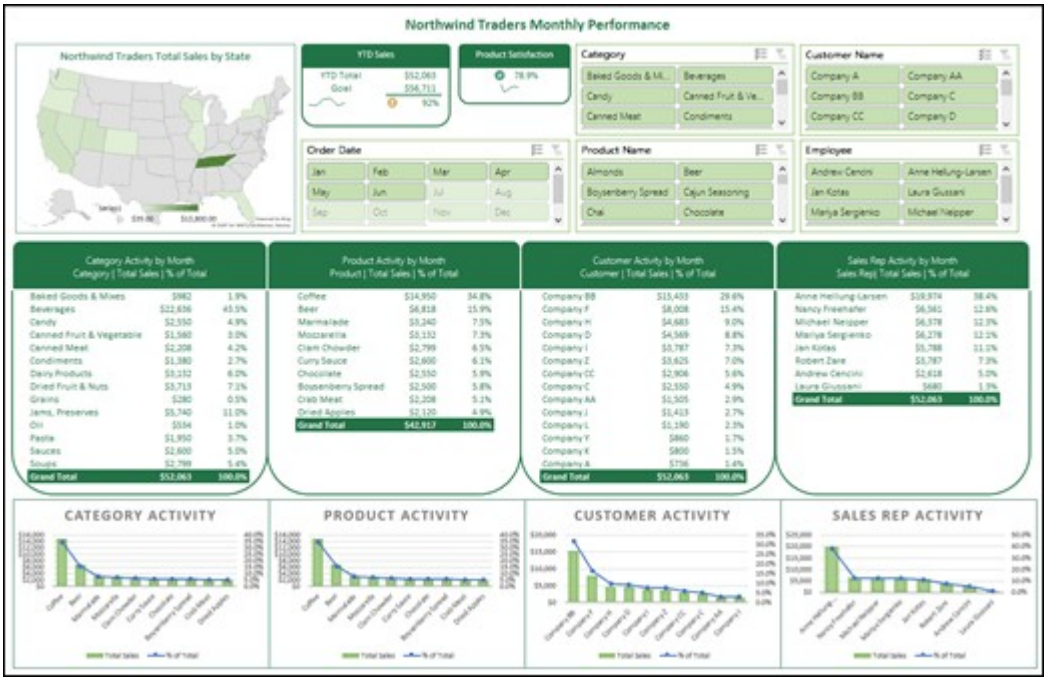
- **Spreadsheet Software:** Tools like Excel or Google Sheets can be used for simple dashboards.
- **Specialized Dashboarding Tools:** Platforms like Tableau, Power BI, Sisense, Zoho Analytics, Metabase, or Geckoboard offer more advanced features.
- **Web Application Development:** For complex, custom dashboards, consider web development frameworks and libraries.

5. Development and Testing:

- **Implementation:** Build the dashboard based on the design and chosen tools.
- **Testing:** Thoroughly test the dashboard to identify and fix any errors or issues.

6. Deployment and Maintenance:

- **Deployment:** Make the dashboard accessible to the intended users.
- **Maintenance:** Regularly update data, monitor performance, and address any user feedback.
    - dashboard is a visual representation of key metrics that allows you to quickly view and analyze your data in one place. Dashboards not only provide consolidated data views, but a self-service business intelligence opportunity, where users are able to filter the data to display just what's important to them. In the past, Excel reporting often required you to generate multiple reports for different people or departments depending on their needs.



- **Overview**
- In this topic, we'll discuss how to use multiple PivotTables, PivotCharts, and PivotTable tools to create a dynamic dashboard. Then, we'll give users the ability to quickly filter the data the way they want with Slicers and a Timeline, which allow your PivotTables and charts to automatically expand and contract to display only the information that users want to see. In addition, you can quickly refresh your dashboard when you add or update data. This makes it very handy because you only need to create the dashboard report once.

- For this example, we're going to create four PivotTables and charts from a single data source.
- Once your dashboard is created, we'll show you how to share it with people by creating a Microsoft Group. We also have an interactive Excel workbook that you can download and follow these steps on your own.

Steps to create hr dashboard

Step 1: Define the Purpose of Your Dashboard

Before you jump into building your dashboard it is necessary to do some groundwork. A good analytics platform can help you organize your data into insights and present it, but if you, the creator, do not have a clear vision for your dashboard, then users will be unable to glean anything from it. To gain inspiration and a better understanding of what makes a dashboard fit for purpose, check out these examples of healthcare dashboards.
The overarching goal of any dashboard is to support users to make informed decisions, by providing them with access to data insights presented to them in a logical and accessible way. So, before doing anything else, you need to understand the problem you want to solve, and how your dashboard will provide the solution.
The best way to clarify the purpose of your dashboard is to research your users and their needs. It can be helpful to put yourselves in the user's shoes by answering these kinds of questions:

- How do they currently accomplish their objectives?
- What are some of the issues and problems they face?
- What information is crucial for them to act on the insights?
- How will they use the dashboard on a day-to-day basis?
- How will they be interacting with the dashboard to create new insights?

Ideally, you'll talk to future users of your dashboard before you create it. This will provide further clarity on what your users need in order to be able to act on your dashboard insights. For more on defining the purpose of your dashboard and user research, check out these tips for building dashboards users love.

Step 2: Connect and Prepare Your Data

A high-quality analytics platform will be able to connect to a variety of data sources. Common data stores or databases include Snowflake, AmazonRedshift, and Google BigQuery. Some platforms also allow you to connect to data source managers (e.g., Dremio or Apache Drill), enabling you to connect to even more existing databases.
Moreover, depending on the analytics platform you choose, ideally, you should be looking to prepare and connect your data once and subsequently build many dashboards on top of it, rather than needing to connect data for each dashboard you build.
Once you have connected your data, you will need a data model. Put simply, this is a visual representation of your data elements and the connections between them. **By defining how different data are related, the data model ensures the data on your finished dashboard will be accurate and consistent. So, regardless of how your users interact with your data, they always get it from a single source of truth.**
This is where the logical data model (LDM) comes in. The purpose of the LDM (sometimes referred to as a semantic data model) is to turn your data into something more business-

friendly. It combines data from different sources in a logical manner, acting as a blueprint that represents the definitions and characteristics of your data elements.

When it comes to building the LDM, the most common methods are:

- Drag-and-drop: With some platforms, you can use drag-and-drop to create tables (and the relationships between them), add attributes, and set primary keys.
- Application Programming Interface (API): An API can be used to programmatically create, modify, or query the data model.
- Python SDK: Use this method to access libraries and functions to create tables, define attributes, set primary keys, and establish relationships.

An optimal analytics platform will allow you to build your LDM with any of the above-mentioned methods. If you connect to a specific data source, some can even identify the data model components and automatically generate the LDM for you. That way, you'll only need to select and add the tables you need.

Step 3: Plan Your Dashboard Layout

Now you know the purpose of your dashboard and have prepared the data, it is time to sketch out what your dashboard might look like. You can start with paper and a sharpie, before progressing to a simple tool like Balsamiq or Whimsical to create a wireframe.

During this stage, it is important to keep the information about your future users from the previous steps at the forefront of your mind. Your dashboard information architecture should be clear and intuitive so that users can easily find what they want. Aspects to consider when planning the information architecture include:

Navigation: How will users move between different areas of your dashboard, or between different dashboards (if multiple dashboards are required to meet your main purpose)? Consider whether elements such as tooltips, drills, and links are necessary, and if so, where and how they can be used.

Grouping: As a general rule of thumb, similar information should be grouped together. Typical examples of grouping include putting the same metrics together in one place (e.g., all expense metrics, all losses metrics, etc.), or grouping by category (first-time customers, returning customers, etc).

Labeling: What labels do you need to include to help users understand what they are looking at? Labels should be clear and concise, allowing users to easily absorb the information your dashboard is designed to convey.

Filtering: What aspects do your users need to filter for? Check your user research to remind yourself of the kind of information they will be searching for and how they need to narrow down the scope of the data displayed.

At this stage, you'll also want to make sure you're choosing the most effective visualization type for the information you're trying to convey. For example, to show comparisons between categories it's best to opt for a bar chart or column chart. Whereas if you want to compare parts to the whole, a pie chart, donut chart, or tree map is the better choice. **When building your dashboard, creating different types of visualizations can be achieved with the click of a button, but knowing when and why to choose a particular visualization is a delicate art.** Check out our introductory post on visualizations to learn more about this.

Step 4: Build Your Dashboard

You're now ready to use the information in your wireframe to build your dashboard. The best analytics platforms make building and editing dashboards easy. The data model ensures that all the metrics, facts, and attributes are available within the user interface (UI) to create the insights you need. Simply drop the insights you want to include directly into the dashboard and modify your visualizations from there. The drag-and-drop functionality can be compared to building with Lego bricks; it can be highly satisfying to see your dashboard quickly take shape.

Creating a dashboard is easy with drag-and-drop

To improve user engagement and make the dashboard more interactive, you'll need to add filters to allow users to narrow down on relevant information. The main filters are attribute filters and date filters, both of which should be implementable with a few mouse clicks.

Setting up an attribute filter for your dashboard

Drilling is another way for users to better explore your dashboard's data. This involves linking elements in your visualizations to other visualizations (or other dashboards), allowing users to delve deeper into the data and get the insights they need. Your analytics platform should make this easy to set up, you simply need to define and set the drill.

In the dashboard below, a drill into visualization has been defined. When users click a point on the graph it takes them to another visualization, which shows them more detailed information and breakdowns.

Pause

The above are just some of the features you might use when building your dashboards, and the best platforms make several additional features available. One way to discover some of these first-hand is to request a demo of our platform.

Step 5: Customize the Appearance of Your Dashboard

Once you've built your dashboard, you'll want to align its appearance with the product, app, or web portal you plan to embed it into. **Even if you don't plan to embed, you'll still want it to match your branding so that it's similar to what people are used to and it looks like it has been specifically designed for your company or business.**

As well as removing and replacing the analytics platform's branded elements with your own (white-labeling), other aspects to consider customizing include:

- The overall theme of your dashboard.
- Color schemes of visualizations and insights.
- The display language to reflect localization.
- Time zones, and date formats: a must if you have offices or companies spread across the globe.

Step 6: Embed Your Dashboard

Embedding is a popular method by which to share, or rather, distribute dashboards to users as it allows for even more customization. **Put simply, embedding is the process of integrating dashboards from an analytics platform into an application or web portal.** By combining

the two pieces of software, the end product appears as one cohesive whole, rather than two separate products.

Embedding is one of the best ways to integrate dashboards (and your analytics) into a SaaS application.

Examples of embedding methods include:

1. Basic embedding via iFrame
2. Web Components
3. Embedding prebuilt dashboards and visuals with SDKs
4. Programmatic Embedding with SDKs

HR analytics and reporting

HR analytics and reporting involve collecting, analyzing, and presenting HR data to understand workforce trends, improve decision-making, and drive business outcomes. These reports provide insights into various aspects of the workforce, such as recruitment, training, employee engagement, and retention. They help organizations make data-driven decisions that can lead to better management and development of employees.

Key Aspects of HR Analytics and Reporting:

- **Data Collection:**
  Gathering HR data from various sources, such as HRIS, payroll systems, and employee surveys.
- **Data Analysis:**
  Identifying key performance indicators (KPIs) and analyzing trends to reveal insights.
- **Report Generation:**
  Presenting the findings in a clear and concise manner, often using dashboards and visualizations.

  Types of HR Reports:
  - **Employee Information Reports:** Provide details about employee demographics, roles, and performance.
  - **Recruitment Reports:** Track the effectiveness of recruitment efforts, including time-to-hire, cost-per-hire, and source of hire.
  - **Onboarding and Offboarding Reports:** Monitor the efficiency of onboarding and offboarding processes.
  - **Performance Management Reports:** Assess employee performance, identify areas for improvement, and track progress.
  - **Compensation Reports:** Analyze salary structures, benefits, and compensation packages.
  - **HR Administration Reports:** Track HR-related activities, such as time and attendance, leave management, and HR compliance.

  Benefits of HR Analytics and Reporting:
- **Improved Decision-Making:**
  By leveraging data, HR professionals can make more informed decisions about workforce planning, talent acquisition, and employee development.
- **Increased Productivity:**
  Analyzing HR data can help identify areas where productivity can be improved, such as streamlining processes or optimizing resource allocation.
- **Enhanced Employee Engagement:**
  By understanding employee needs and preferences, organizations can create a more engaging and supportive work environment.
- **Reduced Costs:**

Analyzing HR data can help identify areas where costs can be reduced, such as optimizing hiring practices or reducing employee turnover.

- **Improved Business Outcomes:**
  By using data to drive HR decisions, organizations can improve their overall business performance.

Human Capital disclosure and its importance

Human capital disclosure refers to the reporting of a company's investments in and management of its workforce, including factors like skills, education, training, and employee well-being. This disclosure is increasingly important because it provides investors and other stakeholders with insights into how a company manages its human capital, which is a critical factor in its long-term success and value creation.

Importance of Human Capital Disclosure:

- **Enhances Investor Confidence:**
  By disclosing human capital information, companies can demonstrate to investors how they are developing and utilizing their workforce, which can build confidence in the company's future prospects and ability to adapt to change.
- **Improves Decision-Making:**
  Investors, creditors, and other stakeholders can make more informed decisions when they have access to data on how a company manages its employees, including training, compensation, and employee engagement.
- **Drives Accountability:**
  Public disclosure of human capital initiatives and commitments, such as diversity and inclusion programs, can help ensure companies are held accountable for their promises and progress.
- **Attracts and Retains Talent:**
  Transparent human capital practices, including fair compensation and opportunities for growth, can make a company more attractive to potential employees and improve employee retention.
- **Recognizes Human Capital as an Intangible Asset:**
  Human capital is a significant, yet often overlooked, asset that drives innovation, productivity, and overall company performance. Disclosure helps quantify and communicate its value.
- **Aligns with ESG Frameworks:**
  Human capital disclosure is a crucial element of Environmental, Social, and Governance (ESG) reporting, which is gaining increasing prominence among investors and other stakeholders.
- **Provides Insights into Workforce Management:**
  Disclosures can reveal how effectively a company manages workforce risks and opportunities, including talent acquisition, development, and retention strategies.
- **Supports Long-Term Value Creation:**
  By demonstrating a commitment to developing and engaging its workforce, a company can create a sustainable competitive advantage and drive long-term value.

  In essence, human capital disclosure is not just about compliance; it's about demonstrating a company's commitment to its most valuable asset – its people – and communicating that commitment to stakeholders to drive value and success.

Components of HR Analytics Reporting

What are the pros and cons of HR analytics?

HR analytics is a valuable tool, but like any tool, it has its advantages and disadvantages. Here's a breakdown of the pros and cons to consider:

Pros of HR analytics

- **Data-driven decision making:** HR analytics replaces intuition with objective data, leading to more informed and effective decisions across all HR functions.
- **Improved workforce management:** By analyzing trends and patterns in your workforce data, you can identify areas for improvement in areas like recruitment, retention, training, and compensation.
- **Reduced costs:** HR analytics can help optimize HR processes, leading to cost savings in areas like recruitment, training, and turnover.
- **Increased ROI:** By measuring the effectiveness of HR initiatives, HR professionals can demonstrate the return on investment (ROI) of these programs, justifying their value to leadership.
- **Improved employee engagement:** Data-driven insights can help tailor HR programs to meet employee needs and expectations, leading to a more engaged and productive workforce.

Cons of HR analytics

- **Data quality concerns:** Inaccurate or incomplete data can lead to misleading results. Ensuring data accuracy across various HR systems is crucial.
- **Privacy and security risks:** Employee data is sensitive, and organizations need robust data security measures and clear communication regarding data usage to maintain trust.
- **Focus on metrics over people:** Over-reliance on metrics can lead to overlooking the human element of HR. It's important to balance data with qualitative insights.
- **Resistance to change:** Shifting from intuition-based decisions to data-driven approaches can be met with resistance. Effective communication and buy-in from leadership are essential.
- **Technology and expertise limitations:** Implementing HR analytics tools and integrating them with existing systems can be a cost consideration. Additionally, HR professionals might require training in data analysis to leverage these tools effectively.

What types of data are analyzed in HR analytics?

HR analytics gathers information across various aspects of the employee lifecycle. Here are some key categories:

- **Workforce demographics:** Age, gender, education level, tenure, etc. This helps understand workforce composition and identify potential diversity and inclusion gaps.
- **Recruitment data:** Time-to-hire, source of hire, cost-per-hire, applicant demographics. This data helps streamline the hiring process and target the best talent pools.

- **Learning and development:** Training completion rates, skills gaps, effectiveness of training programs. This data helps identify areas for upskilling and ensures training programs deliver value.
- **Performance data:** Performance reviews, goal achievement, productivity metrics. This data helps assess employee performance, identify high performers, and provide targeted feedback.
- **Compensation and benefits:** Salary data, benefits utilization, cost of benefits programs. This data helps ensure fair compensation practices and optimize benefit offerings.
- **Employee relations:** Absenteeism rates, turnover rates, employee satisfaction surveys. This data helps identify areas for improvement in employee well-being and address potential problems.

What are the key components of HR analytics?

Implementing HR analytics requires a solid foundation built on these key components:

- **Data collection:** Establishing a system to gather relevant employee data from various sources like HRIS, performance management systems, and employee surveys.
- **Data storage and integration:** Building a secure and centralized data repository to store and integrate employee data from various sources.
- **Data analysis and reporting:** Utilizing data analysis tools and techniques to extract insights from the collected data and create informative reports and dashboards.
- **Data visualization:** Presenting complex data in a clear and concise way using visuals like charts and graphs for better understanding and communication.
- **Actionable insights:** Deriving actionable recommendations from data analysis to improve HR processes, programs, and overall workforce management.

What metrics are used in HR analytics?

Effective HR analytics hinges on identifying the right metrics to track and analyze. These metrics should be aligned with your overall HR goals and business objectives. Here are some key categories of HR analytics metrics:

- **Recruitment metrics:** Time-to-hire, cost-per-hire, quality of hire (performance of new hires).
- **Learning and development metrics:** Skills gap closure rate, training completion rates, impact of training on performance.
- **Performance management metrics:** Performance ratings, goal achievement rates, productivity metrics.
- **Employee engagement metrics:** Employee satisfaction survey results, absenteeism rates, turnover rates.
- **Compensation and benefits metrics:** Cost of benefits programs, employee satisfaction with benefits, pay equity ratios.

HR Analytics Adoption in organizations

HR analytics adoption is growing as organizations recognize its potential to improve decision-making and optimize workforce management. By leveraging data-driven insights, HR analytics helps organizations make more informed decisions about talent acquisition, employee retention, performance management, and overall business strategy.

Key Aspects of HR Analytics Adoption:

- **Strategic Alignment:**
  HR analytics should be aligned with the overall business goals and strategies of the organization.
- **Data-Driven Decision Making:**
  HR analytics enables organizations to move beyond traditional HR practices and make evidence-based decisions.
- **Improved Talent Management:**
  HR analytics helps optimize talent acquisition processes, identify high-potential employees, and improve employee retention.
- **Increased Efficiency and Productivity:**
  By analyzing employee performance data and identifying areas for improvement, HR analytics can lead to increased efficiency and productivity.
- **Competitive Advantage:**
  Organizations that effectively utilize HR analytics gain a competitive advantage by attracting and retaining top talent and optimizing workforce performance.
- **Challenges in Adoption:**
  Organizations may face challenges in adopting HR analytics, including data quality issues, lack of skilled personnel, and resistance to change.

In essence, HR analytics is transforming how organizations manage their workforce, moving from gut feelings to data-driven decision-making to improve business outcomes.

The literature on HR analytics demonstrates its significant impact on human resource practices across various sectors in India. This review compiles research findings to provide a comprehensive understanding of HR analytics' adoption, evolution, and sector-specific applications, along with the challenges faced during implementation. Aggarwal et al. (2021) explored the impact of company characteristics on HR disclosure practices in Indian public sector enterprises. They developed the Human Resource Disclosure Index (HRDI) and found that market capitalization and ownership concentration significantly influenced HR disclosure, while other variables had negligible associations. Ramachandran (2023) analyzed the adoption of HR analytics in the Indian IT sector, revealing a positive correlation between employee satisfaction and the perception of HR analytics tools. Jauhari (2021) focused on IT Fortune 500 companies, demonstrating how HR analytics tools enhance HR management efficacy and identifying factors that influence their adoption. Similarly, Harshita Agarwal et al. studied the adoption of HR analytics in Indian IT and ITES organizations, identifying key factors that influence change acceptance and laying a foundation for future research in HR analytics. Mathur (2023) examined the adoption challenges of HR analytics among HR professionals in manufacturing firms in Haryana. The study highlighted the benefits of data-driven decisionmaking and the obstacles to effective implementation. Selvaraj et al. (2023) investigated the role of HR analytics in enhancing organizational sustainability within IT companies. Using AMOS and SPSS for data analysis, their research showed a substantial correlation between HR analytics and HRM practices, validating a novel methodological approach for predicting organizational outcomes. Jaikumar et al. (2015) discussed the challenges faced by the Indian retail industry in incorporating HR analytics with store operations. They compared Indian practices with those of global retail giants, identifying deficiencies and offering recommendations for improvement. Jain et al. (2020) explored the

integration of HR analytics into the corporate environment, emphasizing its ability to replace outdated manual processes. The study assessed the application, constraints, and metrics for evaluating organizational suitability for HR analytics adoption. Sharma et al. (2022) reviewed the role of HR analytics in improving organizational decision-making during the pandemic. They emphasized its significance in strategic planning, cost management, and revenue generation. Ameer et al.

(2022) investigated the behavioral intentions that motivate HR professionals to implement HR analytics, using PLS-SEM to validate influencing factors. They found that performance expectancy and facilitating conditions positively impacted adoption, while fear appeals hindered it. Nagpal et al. (2022) discussed the importance of data-driven decision-making in the context of Industry 4.0. They identified critical HR analytics factors—predictive, descriptive, and prescriptive—that enhance employee well-being and influence decision-making in institutions. The reviewed literature collectively highlights the increasing importance of HR analytics across various sectors in India. While the IT and public sectors exhibit higher adoption rates, other industries face challenges that need to be addressed. The research underscores the necessity of strategic implementation and understanding sector-specific dynamics to effectively leverage HR analytics.

Adoption of factors

The factors that influence the incorporation of HR Analytics across various sectors in India must be analyzed when investigating its adoption. These factors typically encompass employee training, leadership support, technological preparedness, and organizational culture. These elements can vary substantially between sectors, which can affect the level and efficacy of HR Analytics adoption, as indicated by previous research(Fernandez & Gallardo-Gallardo, 2021). A sector with a greater degree of technological infrastructure may experience a more seamless integration of HR Analytics than one with limited technological resources, for instance. Sectors that emphasize leadership support and employee development may exhibit more sophisticated adoption practices.

People analytics is an emerging strategic HR practice that has begun to shape how HR departments make strategic workforce decisions. Despite significant growth and progress made in research and practice over recent years, how organizations adopt, implement, and evaluate the performance impact of people analytics on business performance remains a contentious issue requiring further scholarly attention. As such, this chapter outlines how and why people analytics can contribute to business performance. In this way, this chapter systematically examines the progress made toward adopting people analytics, its implementation, and its evaluation. Specifically, we aim to identify the key drivers and barriers to adopting people analytics, how people analytics is used in terms of technology, data, analysis, and actions, and how HR departments evaluate and measure the impact of people analytics. The comprehensive approach enhances our understanding of this emerging practice, advancing the field of people analytics.

MODULE-II

HR metrics

HR metrics are quantifiable measurements that HR departments use to track the effectiveness of their initiatives and strategies, providing insights into workforce performance, talent management, and overall organizational success. These metrics help organizations make data-driven decisions, optimize HR processes, and improve the employee experience.

Here's a more detailed explanation:

What HR metrics measure:

- **Employee performance:**

  This includes metrics like performance ratings, productivity, and employee engagement.

- **Recruitment:**

  Metrics like time-to-hire, cost-per-hire, and source of hire help optimize recruitment processes.

- **Retention:**

  Turnover rate, retention rate, and employee satisfaction are key indicators of employee retention.

- **Training and development:**

  Metrics like training completion rates, training costs, and the impact of training on performance help evaluate the effectiveness of training programs.

- **Compensation and benefits:**

  Metrics related to compensation, benefits costs, and employee satisfaction with compensation help ensure fair and competitive compensation and benefits packages.

- **Cost of labor:**
  Metrics like labor costs per employee and overall compensation costs help manage labor expenses.
  Why HR metrics are important:

- **Data-driven decision making:**

  HR metrics provide data to support HR strategies and decisions, allowing for more informed choices.

- **Improved efficiency:**

  By tracking key metrics, organizations can identify areas where processes can be streamlined and optimized, leading to increased efficiency.

- **Cost reduction:**

  Analyzing HR metrics can reveal opportunities to reduce costs associated with recruitment, training, and employee turnover.

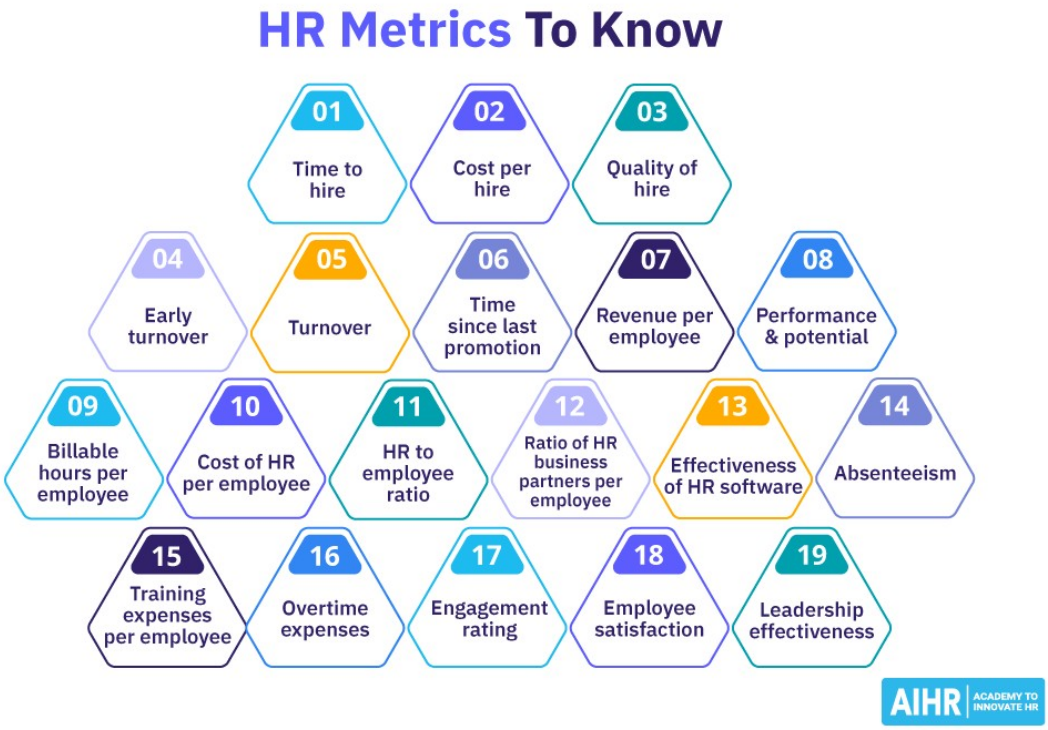
- **Enhanced employee experience:**

  By understanding employee satisfaction and engagement, organizations can implement initiatives to improve the overall employee experience.

- **Strategic alignment:**
  HR metrics help align HR initiatives with the overall business strategy, ensuring that HR efforts contribute to organizational goals.
  Examples of HR metrics:

  - **Turnover rate:** The percentage of employees who leave the company during a specific period.
  - **Absenteeism rate:** The percentage of employees who are absent from work.
  - **Time-to-hire:** The number of days it takes to fill an open position.
  - **Cost-per-hire:** The total cost associated with recruiting and hiring a new employee.

- **Employee engagement score:** A measure of employee satisfaction and commitment to the organization.
- **Training completion rate:** The percentage of employees who successfully complete a training program.
- **Performance rating:** A measure of employee performance based on predetermined criteria.
- **Employee satisfaction with compensation:** A measure of how satisfied employees are with their pay and benefits.



1. Time to hire

Time to hire is one of the most widely used metrics for recruitment. It measures the number of days between a candidate applying for a job and them accepting a job offer. Time to hire gives insights into recruiting efficiency and candidate experience.

Here's how to calculate your average time to hire:

Average time to hire = (1st candidate time to hire in days + 2nd candidate time to hire + nth candidate time to hire) / Total number of jobs

Recruitment efficiency measures the speed at which HR processes a candidate – assessment, interview, and role acceptance. If your organization has a long time to hire, it reflects that your processes are inefficient.

Having a long time to hire might negatively impact the candidate's experience. Candidates may drop out of the recruitment process if it is too long, getting hired by a competitor instead.

Time to hire should not be confused with time to fill. This metric typically measures the days between the approval of a job requisition and the candidate accepting the job offer. This definition is in line with the Society for Human Resource Management (SHRM) and ISO 30414.

2. Cost per hire

The cost per hire is a recruiting metric that shows how much it costs the company to hire new employees. This also serves as an indicator of the efficiency of the recruitment process.

Cost per hire can be time-consuming to work out, as you need to add together internal recruiting costs and external recruiting costs and divide the sum by the total number of hires. The costs and number of hires will both reflect a selected measurement period – such as monthly or annually.

Cost per hire = (Internal costs + External costs) / Total number of hires

Here are some examples of internal and external costs:

Internal costs	External costs
Cost of sourcing	H Singing bonus
Recruitment team costs	Marketing costs
Ai Administrative costs	
R Hiring manager costs	
Technological expenses	
Background checks	

3. Quality of hire

Quality of hire measures the value a new employee brings to an organization. This metric assesses the effectiveness of the recruitment process and the long-term impact of new hires on company performance.

Quality of hire is typically evaluated based on several criteria, including the new employee's job performance, their contribution to achieving team or organizational goals, how well they fit with the company culture, and their retention rate over time.

4. Early turnover

Early turnover – the percentage of recruits leaving in the first year – is arguably the most important metric to determine hiring success in a company. This early leaver metric indicates whether there is a mismatch between the person and the company or between the person and his/her position.

New hire turnover is also very expensive. It usually takes 6 to 12 months before employees have fully learned the ropes and reach their Optimum Productivity Level. The cost of replacing an employee can be as much as 1.5-2x the employee's annual salary, especially for more senior roles.

You can calculate early turnover as follows:

Early turnover rate = (# of new hires who have left the organization during period / # of new hires who from that same period) x 100

5. Turnover

This metric, usually expressed as a percentage, shows how many workers leave the company in a given year. When combined with, for instance, a performance metric, the turnover metric can track the difference in departures of high and low performers.

Preferably, you would like to see low performers leave and high performers stay. This metric also provides HR professionals with a great amount of information about the departments and functions in which employees feel at home and where in the organization they do not want to work.

Turnover is very useful data to know when shaping recruitment strategies. Additionally, it could be a key metric in measuring a manager's success.

Here's how to calculate employee turnover rate:

Turnover rate = (# Terminations during period / # Employees at beginning of period) x 100

6. Time since last promotion

This rather straightforward metric is useful in explaining why your high potentials leave. It looks at the average time in months since the last internal promotion.

HR metrics examples related to revenue

7. Revenue per employee

The revenue per employee metric shows the efficiency of the organization as a whole. It is an indicator of the quality of the workforce.

The metric looks at the ratio of the organization's total revenue divided by the current number of employees and is usually calculated on an annual basis:

Revenue per employee = Total revenue / Number of employees

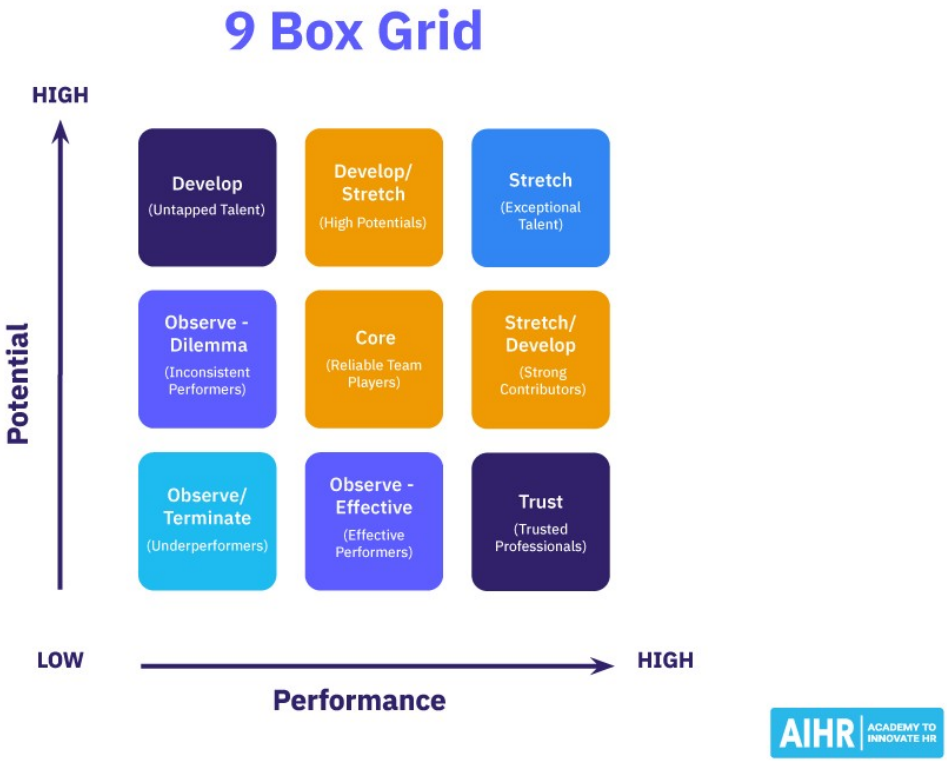
It's useful for comparing the year-on-year development of your revenue per employee, as well as comparing your organization to your competitors.

Another related metric is revenue per FTE.

8. Performance and potential

There are many qualitative and quantitative ways to measure employee performance. Metrics include Net Promoter Score, management by objectives, number of errors, 360-degree feedback, and forced ranking.

Another useful tool is the 9 box grid, which assists in measuring and mapping both an individual's performance and potential in three levels. This model shows which employees are underperformers, reliable team players, high potentials, or exceptional talent:



This tool is great for differentiating between, for example, wanted and unwanted turnover.

9. Billable hours per employee

This is the most concrete example of a performance measure, and it is especially relevant in professional service firms (e.g., law and consultancy firms). Relating this kind of performance to employee engagement or other input metrics makes for an interesting analysis. Benchmarking this metric between different departments and managers/partners can also provide valuable insights.

This metric also relates to employee utilization rate, which refers to the amount of working time an employee is spending on billable tasks.

Other HR metrics examples

10. Cost of HR per employee

The cost of HR per employee is calculated by dividing the total cost of HR operations by the total number of employees in the organization. It is usually expressed in dollars and calculated per specific period, for example, on an annual basis.

Total HR costs refer to all expenses related to HR functions over a specific period. This includes salaries of HR staff, costs of HR systems and software, training and development expenses, recruitment costs, benefits administration, and any other HR-related expenditures.

Cost of HR per employee = Total HR costs / Total number of employees

11. HR to employee ratio

HR to employee ratio is another measure that shows HR's efficiency. It indicates the number of HR professionals in an organization relative to the total number of employees.

Our State of HR research showed that the typical HR to employee ratio is around 1:50 or 2%, which means that there are 2 HR professionals for every 100 employees.

HR to employee ratio = Number of HR employees / Total number of employees

The ideal HR-to-employee ratio can vary significantly depending on the industry, the complexity of HR needs, the level of automation in HR processes, and the specific responsibilities handled by the HR department.

12. Ratio of HR business partners per employee

This metric is similar to the HR to employee ratio but looks specifically at HR business partners. This ratio is crucial for understanding how equipped the HR department is to provide strategic support and partnership to the business units it serves.

13. Effectiveness of HR software

The effectiveness of HR software is a more complex metric. The effectiveness of, for instance, learning and development software is measured in:

- The number of active users
- Average time on the platform
- Session length
- Total time on the platform per user per month
- Screen flow, and
- Software retention.

14. Absenteeism

Like turnover, absenteeism is also a strong indicator of dissatisfaction and a predictor of turnover. Absenteeism rate can give information to prevent this kind of leave, as long-term absence can be very costly.

Again, differences between individual managers and departments are very interesting indicators of (potential) problems and bottlenecks.

This is how you can calculate your absenteeism rate:

Absenteeism rate = (Number of absent days / Total working days) x 100

15. Training expenses per employee

Training expenses per employee is a metric that quantifies the average amount of money an organization spends on the training and development of each employee over a specific period, typically a year. This figure is key for understanding the investment an organization makes in enhancing the skills, knowledge, and competencies of its workforce.

You can calculate training expenses per employee as follows:

Training expenses per employee = Total training expenses / Total number of employees

16. Overtime expenses

Overtime expenses refer to the additional costs incurred by an organization when employees work beyond their regular working hours and are compensated at a higher rate, as mandated by labor laws or company policies.

These expenses are a form of direct labor cost and can significantly impact an organization's payroll budget. That's why it's important to keep track of them.

Here's an overtime expenses calculation formula:

Overtime expenses = Total overtime hours worked x Overtime pay rate

Soft HR metrics examples

Soft HR metrics refer to the qualitative aspects of HR management that focus on measuring intangible elements related to the workforce's attitudes, behaviors, and perceptions.

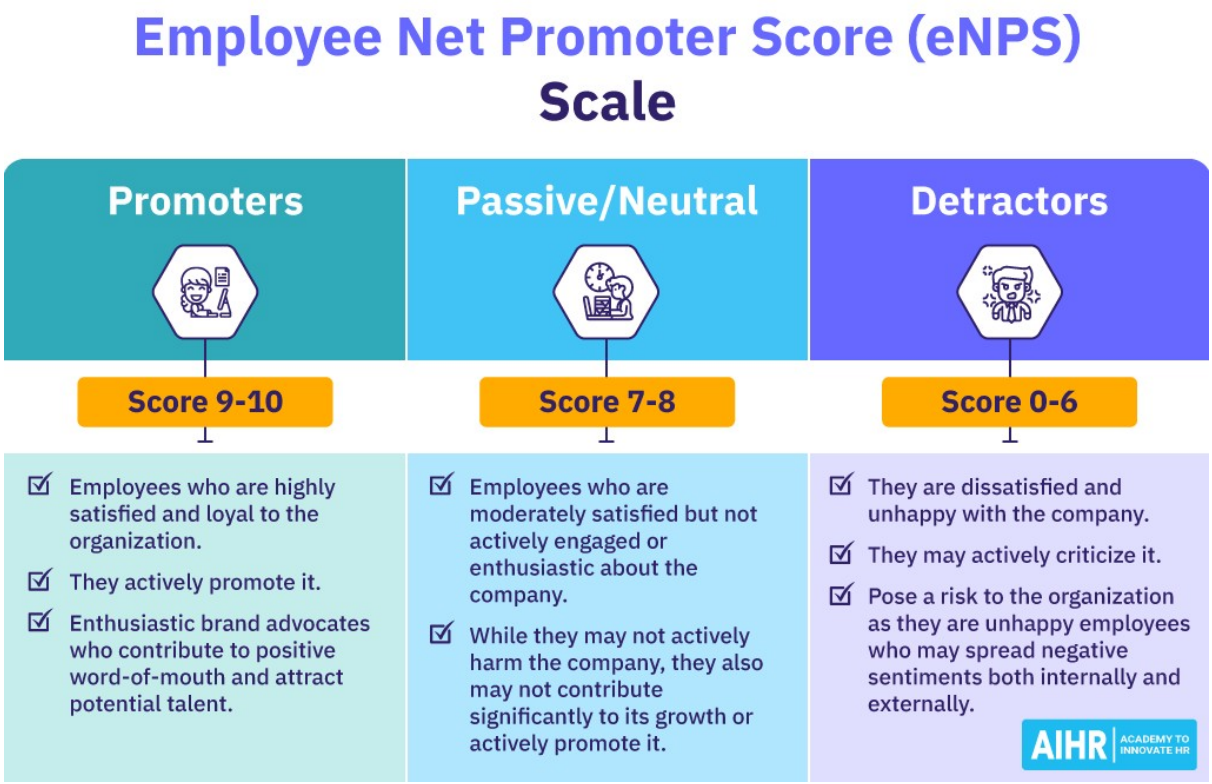
Unlike hard HR metrics, which are quantitative and directly measurable (such as turnover rates or cost per hire), soft HR metrics delve into the subjective experiences of employees within an organization. These metrics typically assess employee satisfaction and engagement levels, leadership effectiveness, and the impact of training and development programs.

17. Engagement rating

An engaged workforce is a productive workforce. Engagement might be the most important 'soft' HR outcome. People who like their jobs and who are proud of their company are generally more engaged, even if the work environment is challenging and pressure can be high.

Engaged employees perform better and are more likely to perceive challenges as positive and interesting. Additionally, team engagement is an important metric for a team manager's success.

Engagement rating is often expressed as employee net promoter score (eNPS). This measures how likely your employees are to recommend your organization to their friends or family as a good place to work on a scale of 1-10.



18. Employee satisfaction

Employee satisfaction metrics help you evaluate how happy and content employees are with their job roles, work environment, and the organization as a whole.

This soft HR metrics is often measured through surveys and questionnaires that ask about various aspects of the job and workplace, including work-life balance, management effectiveness, and job security.

19. Leadership effectiveness

The leadership effectiveness metric gauges the impact of leadership on employee performance, morale, and overall organizational climate.

It can be measured through 360-degree feedback surveys, where employees rate their leaders on a range of leadership competencies, such as communication, decision-making, empathy, and the ability to inspire and motivate.

HR metrics are quantifiable measurements used to assess the effectiveness of HR practices, while HR analytics involves using data analysis to gain insights and make strategic decisions based on those metrics. In essence, metrics provide the data, and analytics uses that data to inform HR strategies and improve business outcomes.

HR Metrics:

- **Definition:**

  HR metrics are specific, measurable data points that track the performance of HR functions.

- **Purpose:**

  They help evaluate the efficiency and effectiveness of HR initiatives, such as recruitment, training, and employee performance.

- **Examples:**

  Common HR metrics include turnover rate, cost per hire, employee satisfaction scores, training completion rates, and absenteeism.
  HR Analytics:

- **Definition:**

  HR analytics is the process of collecting, analyzing, and interpreting HR data to gain insights and improve decision-making.

- **Purpose:**

  It goes beyond simply measuring data; it uses data analysis to understand trends, predict future outcomes, and identify areas for improvement.

- **Examples:**

  HR analytics can be used to identify factors contributing to high turnover, predict employee performance, and optimize recruitment strategies.
  Key Differences:

- **Focus:**

  Metrics are focused on measurement, while analytics is focused on analysis and interpretation.

- **Depth of Insight:**

  Metrics provide basic data points, while analytics provides deeper insights into the reasons behind the data.

- **Actionable Outcomes:**

  Metrics inform basic reporting, while analytics drives strategic decision-making and action.
  Relationship:

  HR metrics are the foundation for HR analytics. Without well-defined and tracked metrics, it's impossible to conduct meaningful HR analytics. HR analytics leverages the data collected through metrics to provide valuable insights that can be used to improve HR practices and business outcomes.

  In essence, HR metrics are the "what" and HR analytics is the "why" and "how".

Analytics vs metrics: What's the difference?

Metrics and analytics are two important concepts in the present world of data analytics, but they are two different things. While both refer to ways of interacting with (and collecting) data, they serve different purposes in the data analysis process.

If we break it down to the basics, metrics are the starting point of your data analysis. They are the raw data you collect to measure particular aspects of your product. And analytics is the process of analyzing and interpreting that data to draw insights and make data-driven decisions.

Analytics has nothing to do with data collection. Instead, the second step in the data analysis process gives meaning to the data you get from the raw metrics. And when you can combine the metrics and analytics properly, you can gain a deeper understanding of your customers and performance.

Categories of customer analytics

Customer analytics involves using both quantitative and qualitative data to understand customer behavior and preferences. There are several categories of customer analytics: descriptive, diagnostic, predictive, and prescriptive analytics.

Categories of customer analytics.

Descriptive analytics is the process of summarizing and presenting past events and behaviors in a meaningful way. It helps you make more informed decisions by providing accurate data and a complete picture of customers' behavior and history.

Diagnostic analytics explores data to understand the reasons behind certain outcomes. You can often use it to identify the root causes of specific customer behaviors and develop actionable strategies.

Predictive analytics predicts future customer behavior by analyzing historical data and trends. It uses algorithms and statistical models to help you understand what may happen in the future. You can use it to anticipate customer needs, identify trends, and take preemptive measures to improve the customer experience.

Prescriptive analytics uses data and mathematical models to suggest the best action. This type of analytics uses customer behavior data to recommend strategies for improving your customer journeys. For example, you can use it to improve customer engagement, pages per session, branded search website traffic, etc.

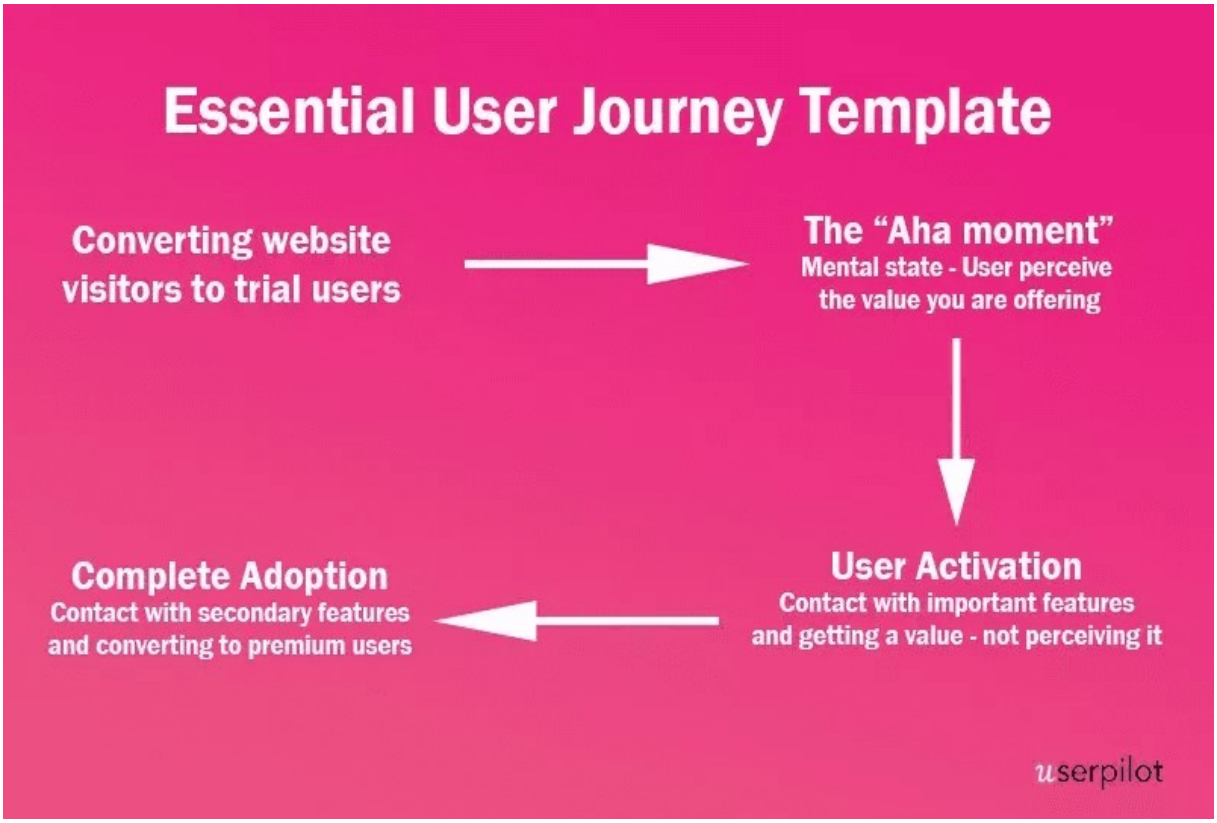
Types of product analytics

While customer analytics focuses on customer behavior across all the journey stages, product analytics closely examines customer interaction with each feature of the product. It aims to identify and address friction points.

Below are the common types of product analytics:

Journey analytics

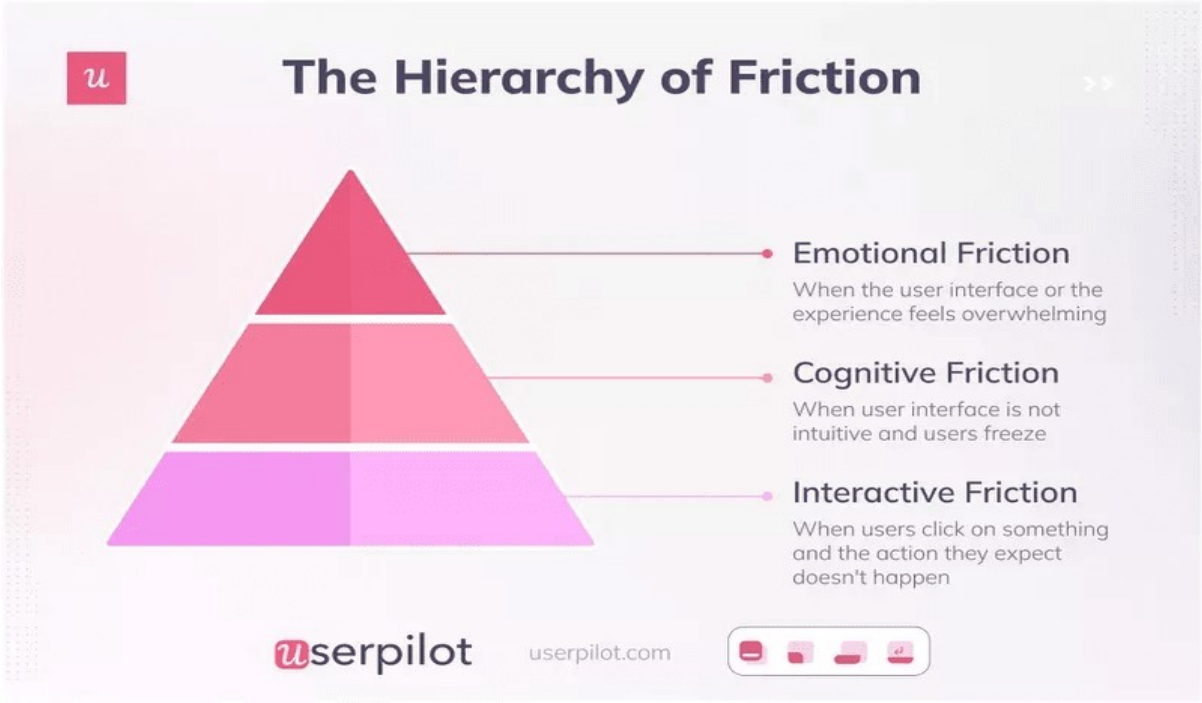
It helps you measure the effectiveness of your touchpoint strategies by offering insights into the customer journey. You can then identify and eliminate the pain points that prevent customers from moving from one stage to another across the user journey.



User journey template.

Experience analytics

This analytics focuses on identifying the friction points in the customer experience. After identifying them, you can take action to eliminate them and drive satisfaction with a seamless customer experience.



The hierarchy of friction.

Engagement Analytics

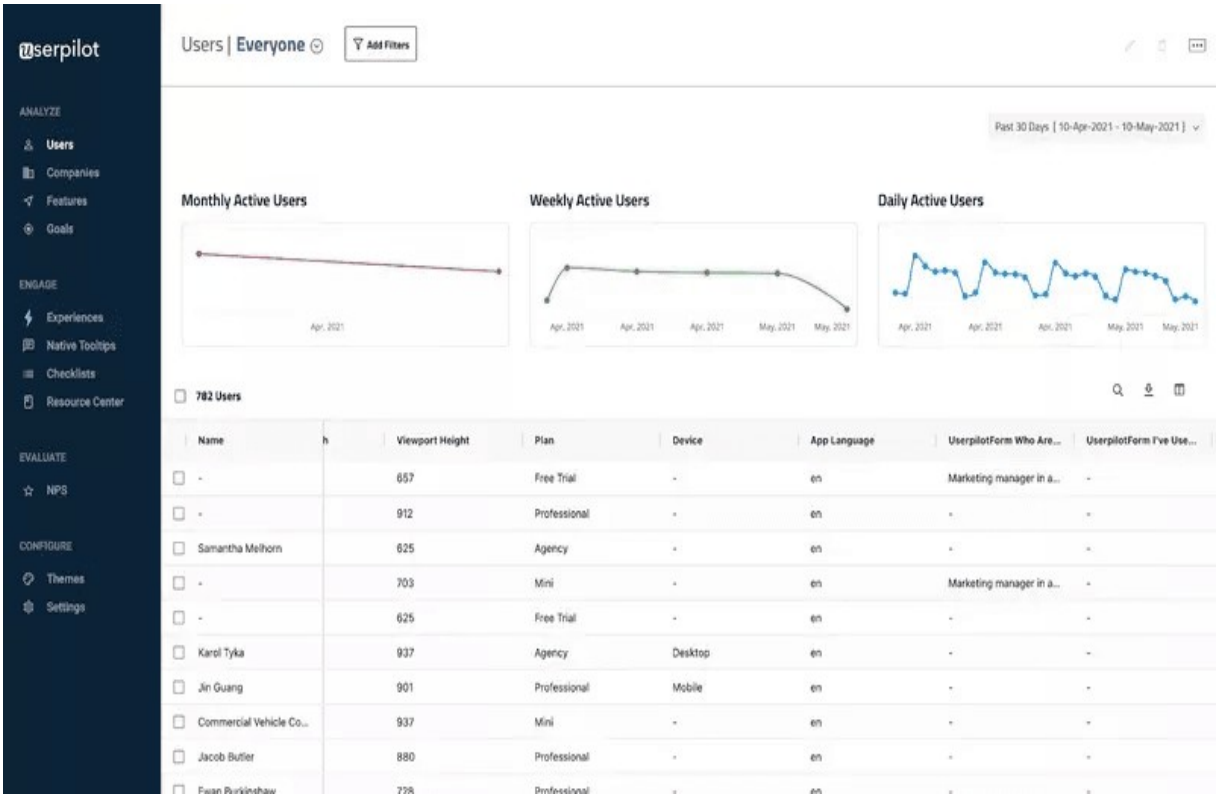
This analytics provides insights into your users' interactions to help you find solutions to boost engagement. Using engagement analytics, you can retain more customers and create unique user adoption flywheels.

Customer interaction tracking.

Behavior Analytics

It helps you understand customer behavior across every touchpoint and channel. With it, you can identify trends in how your customers behave and make data-driven decisions to optimize customer behavior.

Userpilot helps with behavioral analyses:



Behavioral analysis on Userpilot.

Retention Analytics

This analytic helps you understand how satisfied your customers are with your products or services. You can use it to improve your customer retention rate, get more account expansion opportunities, and grow your revenue.

Loyalty analytics

Loyalty analytics shows the likelihood of your customers recommending your products or services to others. You can leverage it to have loyal customers who will bring in more customers through advocacy and word-of-mouth marketing.

Recruitment metrics

Recruitment metrics are quantifiable measurements used to assess and improve the effectiveness of an organization's hiring process. They provide insights into various aspects of recruitment, from sourcing candidates to onboarding new hires. Tracking these metrics helps identify areas for improvement and optimize the overall hiring strategy.

Here's a breakdown of common recruitment metrics:

Efficiency Metrics:

- **Time to Fill:** Measures the duration between when a job opening is created and when it's filled.
- **Time to Hire:** Measures the duration between when a candidate applies and when they are hired.
- **Application Completion Rate:** Indicates the percentage of applicants who complete the entire application process.
- **Applicants per Opening:** Shows the average number of applicants for each job opening.

- **Sourcing Channel Effectiveness:** Evaluates which channels (e.g., job boards, social media) are most effective at attracting quality candidates.
- **Interview-to-hire ratio:** Measures how many interviews are needed to make a hire.
  Quality Metrics:
- **Quality of Hire:** Assesses the performance and long-term success of new hires.
- **Offer Acceptance Rate:** Tracks the percentage of job offers that are accepted by candidates.
- **First-year Attrition:** Measures the percentage of new hires who leave the company within their first year.
- **Hiring Manager Satisfaction:** Gauges the satisfaction of hiring managers with the new hires and the hiring process.
- **Candidate Experience:** Assesses the overall experience of candidates throughout the recruitment process.
  Cost Metrics:
- **Cost per Hire:** Calculates the total cost associated with hiring a new employee.
- **Candidate Diversity:** Tracks the diversity of the candidate pool and new hires.
  By monitoring these metrics, organizations can gain valuable insights into the effectiveness of their recruitment strategies, identify areas for improvement, and ultimately make better hiring decisions.

  Cost per hire, time to fill, time to hire, employee retention, and Employee Net Promoter Score (eNPS) are all important recruitment metrics. Cost per hire (CPH) measures the average cost of bringing on a new employee, while time to fill and time to hire assess the efficiency of the recruitment process. Employee retention reflects how well a company holds onto its employees, and eNPS gauges employee satisfaction and their willingness to recommend the company.

  Cost Per Hire (CPH):
- CPH is a key metric that reflects the financial efficiency of the recruitment process.
- It represents the total cost associated with hiring a new employee, including advertising, recruiter time, background checks, and onboarding.
- By tracking CPH, organizations can identify areas where they may be overspending or underspending and optimize their recruitment budget.
- The formula for calculating CPH is: (Total Internal Recruiting Costs + Total External Recruiting Costs) / Total Number of Hires.
- Internal costs include salaries of HR and recruiting staff, recruitment training, and overhead costs.
- External costs encompass advertising fees, agency fees, and other expenses related to external recruitment.
  Time to Fill:
- Time to fill measures the total duration it takes to fill a vacant position, from the moment it's opened until a candidate accepts the offer.
- This metric is a crucial indicator of the efficiency of the recruitment process.
- It helps organizations identify bottlenecks and streamline their hiring process.
- Time to fill can be calculated as: Offer Acceptance Date - Job Posting Date.
  Time to Hire:
- Time to hire focuses on the period between a candidate applying for a job and accepting the offer.
- It highlights the efficiency of the hiring team in identifying, engaging, and moving candidates through the recruitment pipeline.

- It's a valuable metric for understanding how quickly a company can secure top talent.
- Time to hire can be calculated as: Offer Acceptance Date - Application Submission Date.

Employee Retention:

- Employee retention is the ability of an organization to retain its employees, minimizing turnover.
- High employee turnover can be costly and disruptive, impacting productivity and morale.
- Tracking employee retention rates helps organizations understand how well employees are adapting to their roles and whether they are satisfied with their work.
- Effective retention strategies include competitive compensation, career development opportunities, and a positive work environment.

Employee Net Promoter Score (eNPS):

- eNPS measures employee loyalty and their likelihood to recommend the company as a great place to work.
- It's a simple survey question: "On a scale of 0-10, how likely are you to recommend our company as a place to work?"
- Employees are categorized as promoters (9-10), passives (7-8), or detractors (0-6).
- The eNPS is calculated by subtracting the percentage of detractors from the percentage of promoters.
- A higher eNPS score indicates greater employee satisfaction and loyalty.

Training metrics

Training metrics are quantifiable measurements used to assess the effectiveness of employee training programs. They help organizations understand how well employees are learning, applying new knowledge or skills, and whether the training is achieving its intended business goals. These metrics can range from simple completion rates to more complex calculations like return on investment (ROI).

Here's a breakdown of key training metrics:

1. Completion Rate: This measures the percentage of participants who finish a training program. A high completion rate indicates learner engagement and effective course design.

2. Assessment Pass Rate: This metric reflects how well employees grasp the material, measured by their performance on assessments or tests following training. A low pass rate may indicate a need to revise the training content or delivery.

3. Employee Feedback: Gathering feedback through surveys or interviews provides qualitative data on the learning experience, helping identify areas for improvement and gauge overall satisfaction.

4. Time to Competence/Proficiency: This metric measures how long it takes for employees to reach a desired level of skill or knowledge after completing the training.

5. Knowledge Retention: This assesses how well employees retain the information learned over time, often measured through follow-up assessments.

6. Employee Retention: High retention rates after training can indicate the training's effectiveness in improving employee satisfaction and reducing turnover.

7. Training Cost Per Employee: This metric helps track the financial investment in training and allows for comparisons with industry benchmarks.

8. Return on Investment (ROI): This measures the profitability of the training program by comparing the benefits gained (e.g., increased productivity, reduced errors) to the cost of the training.

9. Learner Engagement: This encompasses various metrics like time spent on training, participation in activities, and feedback scores, indicating how actively involved learners are in the training process.

10. Performance Improvement: This metric tracks changes in employee performance after training, often measured through key performance indicators (KPIs) relevant to their job roles.

By tracking these metrics, organizations can gain valuable insights into the effectiveness of their training programs, identify areas for improvement, and ultimately ensure that training investments lead to a more skilled, engaged, and productive workforce.

Training cost per employee

Training cost per employee is the total cost of employee training divided by the number of employees trained. This metric helps organizations understand their investment in human capital development and its impact on the business. It encompasses direct costs like training materials, instructors, and facilities, as well as indirect costs like employee wages during training and potential productivity loss.

Here's a breakdown of how to calculate and understand training cost per employee:

1. Calculate Total Training Costs:

- **Direct Costs:**

  Include expenses like training materials, LMS fees, trainer fees, facility costs, and any technology used for training.

- **Indirect Costs:**

  Consider the less obvious costs like employee wages during training time, potential productivity loss, and temporary staffing costs if needed.

2. Determine the Number of Employees Trained:

- Count the total number of employees who participated in the training program during the specified period.

3. Calculate the Cost Per Employee:

- Divide the total training costs by the number of employees trained.

Formula:

Code

Training Cost Per Employee = Total Training Costs / Number of Employees Trained

Example:

If a company spent $10,000 on training materials, $5,000 on instructor fees, and experienced $2,000 in lost productivity, with 10 employees trained, the calculation would be:

1. Total Training Costs: $10,000 + $5,000 + $2,000 = $17,000
2. Training Cost Per Employee: $17,000 / 10 = $1,700

Therefore, the training cost per employee in this scenario is $1,700.

Why is this metric important?

- **ROI Tracking:** Helps assess the return on investment in employee development.
- **Budgeting:** Guides future training budget allocation and planning.
- **Benchmarking:** Allows comparison with industry standards and other companies.

- **Efficiency:** Identifies areas where training costs can be optimized.
- **Strategic Decision Making:** Supports decisions about training programs and development initiatives.

Training ROI (Return on Investment)

Training ROI (Return on Investment) measures the financial value gained from training programs relative to their cost. It assesses whether the benefits of training, such as increased productivity or sales, outweigh the investment in training. By calculating ROI, organizations can demonstrate the effectiveness of their training programs and justify future investments in employee development.

Here's a breakdown of key aspects:

What it is: Training ROI is a financial metric that compares the benefits of training programs (e.g., increased revenue, reduced errors) against the costs of those programs (e.g., course fees, instructor fees, employee time).

Why it's important:

- **Justification:** Demonstrates the value of training to stakeholders, helping secure funding for future programs.
- **Effectiveness:** Helps identify successful programs and areas for improvement.
- **Decision Making:** Provides data for making informed decisions about future training investments.
- **Employee Development:** Shows the impact of training on employee skills and performance.
- **Return on Expectations (ROE):** While ROI focuses on financial returns, ROE considers aligning training with broader stakeholder expectations, such as improved employee engagement or customer satisfaction.
  How to calculate it:

- **Basic Formula:**

  (Net benefits of training - cost of training) / cost of training * 100. This provides an ROI percentage.

- **Net Benefits:**

  This is the difference between the value gained from training and the cost of training. Examples include increased revenue, reduced errors, and decreased employee turnover.

- **Cost of Training:**
  Includes all expenses associated with the training program, such as course materials, instructor fees, and employee time.
  Tools for measurement:

- **Learning Management Systems (LMS):** Many LMS platforms offer tools for tracking learner progress and performance, which can be used to assess the impact of training.
- **Surveys and Assessments:** Gather feedback from participants and measure changes in knowledge and skills.
- **HRIS and Analytics Software:** Track employee performance and correlate it with training data.
- **Custom ROI Calculators:** Develop calculators tailored to specific metrics and data.
  Example:

  If a training program costs $10,000 and results in a net benefit of $15,000 (e.g., increased revenue, decreased errors), the ROI would be: ($15,000 - $10,000) / $10,000 * 100 = 50%. This means the organization gained $0.50 for every dollar spent on training.

The formula for calculating training Return on Investment (ROI) is: (Monetary Benefits - Training Costs) / Training Costs * 100%. This formula helps determine the profitability of a training program by comparing the monetary gains against the total cost of the training.

Here's a breakdown:

- **Monetary Benefits:**

  These are the quantifiable financial gains resulting from the training. Examples include increased revenue, reduced costs (like errors or waste), or improved efficiency.

- **Training Costs:**
  This includes all expenses associated with the training program, such as the cost of materials, instructor fees, employee time spent in training, and any technology or platform costs.
  To calculate ROI:

1. **Calculate Total Benefits:** Add up all the monetary benefits gained from the training.
2. **Calculate Total Costs:** Determine the total cost of the training program.
3. **Apply the Formula:** Subtract the total costs from the total benefits, then divide that number by the total costs, and finally multiply by 100 to express it as a percentage.
   Example:

   If a training program costs $10,000 and results in $15,000 in increased revenue, the ROI would be:

   ($15,000, $10,000) / $10,000, and 100% = 50%.

   This indicates a positive ROI of 50%, meaning for every dollar invested, the organization gained $1.50 (including the original dollar).

   Important Considerations:

- **Intangible Benefits:**

  While the formula focuses on monetary benefits, it's also important to consider non-monetary benefits like improved employee morale, increased job satisfaction, and enhanced skills.

- **Timeframe:**

  ROI calculations can be done over different timeframes (e.g., monthly, quarterly, yearly).

- **Industry Standards:**
  The average ROI for training can vary widely. Some industries might see returns of 25% while others might see 300% or more.
  Revenue per employee

  Revenue per employee is a financial metric that indicates how much revenue a company generates for each of its employees. It's calculated by dividing the total revenue by the number of employees. A higher revenue per employee generally signifies greater efficiency and productivity within the company.

  Calculation:

  To calculate revenue per employee, you simply divide the company's total revenue by the number of employees.

  Code
  Revenue per employee = Total Revenue / Number of Employees

  Example:

If a company has a total revenue of $1,000,000 and 100 employees, the revenue per employee would be $10,000.

Importance:

- **Efficiency and Productivity:**

  A higher revenue per employee suggests that employees are more productive and efficient in generating revenue for the company.

- **Benchmarking:**

  This metric allows companies to compare their performance against competitors in the same industry, helping them identify areas for improvement.

- **Resource Allocation:**

  It can also inform decisions about resource allocation, such as hiring, training, or restructuring.

- **Profitability:**

  While not a direct measure of profit, a higher revenue per employee can contribute to improved profitability by offsetting costs associated with employees.
  Industry Benchmarks:

  Industry benchmarks for revenue per employee can vary significantly. For example, in the IT sector, revenue per employee can range from $49,638 to $61,946 depending on the company. In the e-commerce sector, the average can be around $300,000 per employee, with some companies like Amazon exceeding $1 million, according to AlexanderJarvis.com.

  Considerations:

- **Industry-Specific:**

  Revenue per employee can vary greatly between industries due to different business models and labor costs.

- **Employee Count:**

  It's important to consider whether the employee count includes full-time equivalents (FTEs) or just full-time employees, especially when comparing across companies.

- **Profit per Employee:**

  While revenue per employee is a useful metric, it's also important to consider profit per employee, which takes into account all expenses, to get a more complete picture of financial performance.

Employee engagement metrics

Employee engagement metrics are increasing in importance as ways of working become more complex and remote. These metrics are a vital indicator of employees' level of connectedness and motivation. It goes without saying, but an engaged employee is more productive, contributes towards the company vision more purposefully, and has higher levels of commitment.

Employee engagement is also a key driver of your organization's performance. So what employee engagement metrics should your track to create a motivated, engaged workforce?

*Contents***What are employee engagement metrics?How do you measure employee engagement?1. Voluntary employee turnover rate2. Employee retention rate3. Absenteeism4. Employee Net Promoter Score (eNPS)5. Employee satisfaction6. Employee performance7. Glassdoor.com rating8. ROI on employee engagement9. Customer happiness10. UWES & Gallup Scales**

What are employee engagement metrics?

Employee engagement is the extent to which employees feel a passionate connection to the organization, are committed to their work, and put in the extra effort. Employee engagement metrics, thus, indirectly or directly measure how engaged your employees are.

Based on your measurements, you're able to understand the state of employee engagement at your organization, take action where necessary, and design interventions to improve employee engagement across your company.

How do you measure employee engagement?

There are some things that are easily quantifiable, such as how many miles you run on a daily basis or how many glasses of water you drink per day. Measuring employee engagement is not that straightforward, as it is a combination of motivation, happiness, satisfaction, and commitment, which are not as easy to measure.

Engagement, after all, is a complex topic. For example, you can be highly committed to your work but also be burnt out. You can be happy with your job but not receive feedback from your peers and manager.

There is no single employee engagement metric that tells you everything you need to know about employee engagement. A good dashboard will include a handful of metrics that help you learn about your employees, inform your decisions, and help you to have meaningful conversations with employees. Let's take a look at some of those metrics below:

1. Voluntary employee turnover rate

Highly engaged employees are less likely to voluntarily leave – and this reflects in your voluntary employee turnover rate. Turnover is one of the highest costs for any organization, and a lower turnover leads to less disruption, greater productivity, and more cohesion. The more satisfied an employee is, the less likely they are to resign.

When employees are supported, have good relationships, are being developed, and feel challenged in their work, they are likely to have a longer tenure with the organization. To calculate employee turnover, use the below formula:

You can access this report by SHRM to gain some industry benchmarks of what a good turnover rate looks like, depending on your industry and role.

2. Employee retention rate

Similar to turnover rate, employee retention looks at people who stay at your organization, which indicates their engagement. To calculate employee retention, use the formula below:

A good employee retention rate cuts down on the costs of onboarding a new employee. It also increases productivity – the longer someone is with an organization, the better their understanding of internal processes. This allows employees to do things faster and with greater accuracy.

Finally, a good retention rate will enable you to build good teams and a solid organizational culture while developing the same group of people.

3. Absenteeism

High employee absenteeism might indicate issues with employee engagement. Measuring the absenteeism rate helps you keep track of this. Workplace absenteeism is an indicator of many things, such as poor working conditions, poor governance, bad leadership, or a lack of work-life balance. It can also be an indicator of employee satisfaction – as a high absenteeism rate correlates with low employee satisfaction.

Absenteeism is a behavior that can also have a severe knock-on effect. A higher absenteeism rate results in a greater workload for employees, which, in turn, causes more stress and job

dissatisfaction rate as a result. To calculate employee absenteeism rate, use the below formula:

Different countries have various regulations for sick leave and how absenteeism is viewed, so it is essential to consider this when calculating absenteeism.

4. Employee Net Promoter Score (eNPS)

Employee Net Promoter Score (eNPS) is one of the most well-known HR metrics to measure employee engagement. Organizations often measure it through an employee engagement survey.

This metric is measured by the question "On a scale from 1-10, how likely are you to recommend this organization as a place to work?" or "Based on your experience, how likely are you to recommend our organization to a friend or colleague?" Based on the responses, you can break it down into detractors, passives, and promoters, for example:

- Promoters – Employees that respond either 9 or 10, which is an indication that an employee is satisfied.
- Passives – A score between 7 and 8 indicates the employee is neither happy nor unhappy but feels neutral. They won't recommend the company to a friend, but they won't bad-mouth them either.
- Detractors – Any employee that gives a score below 6, which indicates that the employee is not satisfied.

To calculate your eNPS, the formula is:

Qualtrics provides a clear benchmark of what a good eNPS is.

5. Employee satisfaction

While there is a clear distinction between employee satisfaction and engagement, they are intertwined, and both can be measured through similar metrics.

Employee satisfaction takes into consideration external factors, such as working conditions, benefits, salary.

On the other hand, employee engagement looks at things such as how an employee is intrinsically motivated and whether they buy into the company vision. One of the easiest ways to measure employee satisfaction is through a simple survey, which contains a combination of open-ended and closed-ended questions. Some questions to include in your employee satisfaction survey include:

- Do you feel valued in your role?
- Do you feel that your job is allowing you to use your skills?
- Do you have a good relationship with your manager?
- Do you see a career path to advance your career within the organization?
- Do you feel the organization prioritizes your wellbeing?

Structure the questions in a way that you can analyze them under categories to make sense of the data. This requires each question to have a theme, such as employee wellbeing, career development, leadership, remuneration. Categorizing the questions helps make sense of a large number of responses during the post-survey analysis.

6. Employee performance

Again, highly engaged employees are likely to perform well in their jobs, so your employee performance metrics are also relevant to understanding employee engagement. We can generally divide employee performance metrics into four categories:

- Work quality metrics – Such as number of errors, net promoter score, or 360-degree feedback.
- Work quantity metrics – Such as number of sales, number of units produced, handling time
- Work efficiency metrics – Balancing the qualitative and quantitative employee performance metrics
- Organizational performance metrics – Revenue per employee, human capital ROI

An analysis of work performance vs. employee engagement would be a clear indicator that the two are highly correlated. Improving engagement would lead to an uplift in performance, and vice versa.

7. Glassdoor.com rating

Employee engagement also has a significant impact on employer branding. Namely, what people say about you online tells a lot about how they feel about working for you. Before an employee is likely to interview with an organization, the first thing they are likely to do is to 'Google' them. One of the most popular employer review sites that always appears is Glassdoor, which has established itself as a leading authority on reviewing workplace satisfaction and making that information publicly available. Therefore, focusing on employee satisfaction is not only an internal priority but also affects an organization's ability to attract talent externally.

Ratings on Glassdoor are based on employee feedback, on a 5-point scale:

- 0.00 – 1.50 Employees are "Very Dissatisfied"
- 1.51 – 2.50 Employees are "Dissatisfied"
- 2.51 – 3.50 Employees say it's "Okay"
- 3.51 – 4.00 Employees are "Satisfied"
- 4.01 – 5.00 Employees are "Very Satisfied"

Glassdoor also uses an algorithm to emphasize recent reviews to give them more weight. This is to give viewers the most up-to-date satisfaction score at the company. Former employees also post their comments about what it is or were like to work there. Poor employee satisfaction will reflect in both the quantitative and qualitative data shown on Glassdoor.

Typically, the rating you see on a company profile is the overall rating of all approved reviews that the company has ever received after applying our proprietary algorithm, which among other factors, weights recent reviews more heavily than older ones. It usually takes seven business days for a rating to update after an employee leaves a review.

8. ROI on employee engagement

It’s also important to understand the ROI of high employee engagement. After all, more engaged employees are more productive, and therefore have a higher ROI. This is not just ‘hearsay.’

BestBuy, for example, was able to precisely identify the value of its highest engaged employees and the impact on operating income. BestBuy found that an increase of 0.1% in employee engagement results in more than $100,000 in the particular store’s annual operating income. Studies by Gallup have also found that organizations that prioritize employee engagement can experience a 20% improvement in sales.

9. Customer happiness

A low employee engagement rate often causes low customer satisfaction, and the other way around. Put yourself in any scenario when you’re dealing with client or customer services, and your satisfaction level when the person you’re dealing with is calm, friendly, and goes that extra mile.

An Aberdeen Research report states, *“Customer experiences don’t happen in a vacuum. They are the result of employee activities. Businesses that understand the importance of employee engagement and manage it through a formal program to align to their customer experience goals achieve far superior results”*.

Of course, this is a metric that needs to take into consideration other employee engagement metrics. Oftentimes, customers can be happy, but employees can be burnt out, so it’s important to strike a balance.

10. UWES & Gallup Scales

There are also known employee engagement scales that you can use. The two most well-known and tested are the UWES or GALLUP scales. Both are very well tested. For both scales, higher scores are related to superior business outcomes.

For a full comparison between the two, together with two other methods, check this article on employee engagement measures.

Employee engagement ratio

Employee engagement, defined as the level of an employee's psychological investment in their organization, is currently at 21% globally, according to a recent Gallup report. This signifies a slight decrease from previous years, with managers experiencing the largest

drop. While employee engagement varies by region and work arrangement, a good engagement level is generally considered to be above 70%.

Here's a more detailed look:

- **Global Engagement:**

  The latest global figures from Gallup show that only 21% of employees are engaged, marking a decline from previous years.

- **Manager Engagement:**

  Manager engagement has also seen a decrease, falling from 30% to 27% globally.

- **Engagement Levels:**

  While 21% is the current global average, a good employee engagement level is typically considered to be above 70%, indicating a strong emotional commitment by the majority of employees towards the company's success, according to ThriveSparrow.

- **Regional Variations:**

  Engagement levels differ across regions. For example, Gallup found South Asia has the highest engagement levels, while Europe lags behind.

- **Work Arrangement:**

  Hybrid and remote workers tend to have higher engagement rates compared to their on-site counterparts.

- **Impact of Engagement:**

  Employee engagement is directly linked to various positive outcomes, such as increased productivity, profitability, and customer loyalty, while disengagement leads to higher stress, absenteeism, and turnover.

- **Strategies for Improvement:**
  Effective employee engagement strategies often involve creating a positive work environment, providing opportunities for growth and development, offering regular feedback and recognition, and ensuring clear and consistent communication.
  Employee turnover rate is the percentage of employees who leave a company within a specific time period, while turnover cost refers to the expenses associated with replacing those employees. Understanding both metrics is crucial for businesses to assess the financial impact of employee departures and implement strategies to reduce turnover and its associated costs.

  Turnover Rate:

- **Definition:**

  The turnover rate is a key indicator of employee retention and attrition within an organization.

- **Calculation:**

  It's calculated by dividing the number of employees who left by the average number of employees during a specific period, then multiplying by 100.

- **Example:**
  If a company had 100 employees at the beginning of the year and 10 employees left, the turnover rate would be 10%.
  Turnover Cost:

- **Definition:**

  Turnover cost encompasses all the expenses incurred when replacing an employee, including direct and indirect costs.

- **Direct Costs:**

These include expenses related to recruitment, advertising, onboarding, and training.

- **Indirect Costs:**

  These include lost productivity, decreased morale, loss of knowledge, and potential loss of trade secrets.

- **Calculation:**

  Turnover costs can be estimated by multiplying the number of employees by the turnover rate and the average cost per departure.

- **Example:**

  A company with 200 employees and a 12.5% turnover rate, where the average cost of replacing an employee is $1,950, would have a turnover cost of $48,750.

- **Cost Variability:**
  The cost of replacing an employee can vary significantly based on the employee's role and level of experience, potentially ranging from 30% to 400% of their annual salary.
  urnover Rate Formula:

1. **1. Calculate the average number of employees:**

   (Number of employees at the beginning of the period + Number of employees at the end of the period) / 2.

2. **2. Calculate the turnover rate:**
   (Number of employees who left during the period / Average number of employees) * 100.
   Cost of Turnover Formula:

1. **1. Calculate total cost of turnover:**

   Sum of (Cost of Recruitment + Cost of Onboarding + Cost of Lost Productivity + Cost of Training and Development + Administrative Costs).

2. **2. Calculate total cost of turnover per employee:**

   Average cost of departure = Total expenses for all departures / Number of departures.

3. **3. Calculate total turnover cost:**
   (Total number of employees x Turnover rate x Average cost of departure) OR (Total cost of turnover).
   Example:

   If a company starts with 100 employees, ends with 110, and has 10 employees leave during the year, the turnover rate is calculated as follows:

   1. Average employees: (100 + 110) / 2 = 105
   2. Turnover rate: (10 / 105) * 100 = 9.52%.
      The cost of turnover can be estimated by adding up costs like recruitment, onboarding, and lost productivity, then multiplying by the turnover rate and the number of employees. For example, if the average cost of a departure is $5,000, and the company has 105 employees, the total cost of turnover would be (105 * 0.0952 * $5,000) = $50,000.

MODULE-III
HRIS

An HRIS, or Human Resource Information System, is a software solution that helps organizations manage and automate various HR processes, including employee data management, payroll, benefits administration, and more. Essentially, it's a centralized system for tracking and managing all aspects of an organization's human capital, streamlining operations and improving efficiency. The need for an HRIS arises from the increasing complexity of managing employee information, the need for compliance with labour laws, and the desire to improve overall HR efficiency and employee experience.

Human resources information system overview

HRIS systems – or human resources information systems – were one of the first commercial software solutions to be developed in the 1980s. Why? HR was then – and remains today – one of the most admin-heavy departments in any organisation. Human resource staff are burdened not only with enormous amounts of paperwork and record-keeping, but they are also the stewards of some of the most precious and vulnerable information about their workforce and applicants.

Technology has certainly evolved a lot since then. Modern HRIS solutions can automate workflows, integrate feedback, and adjust reporting structures – in real time – based on changes in business rules or regulatory compliance. And by delivering consumer-grade user experiences and flexible functionality, modern HRIS systems are as efficient and user friendly as they are powerful and agile.

The best HRIS software is delivered in cloud, which provides an even wider range of benefits including more data storage, stronger security, and smoother integration with complementary applications such as payroll, applicant tracking, and other HR systems.

Human resources information system (HRIS) definition

HRIS stands for human resources information system, a software solution that helps companies manage and automate core HR processes and support benefits administration, time and attendance, payroll, and other workflows, as well as the storage of employee data, such as personal, demographic, and compensation information.

Need for HRIS:

Here's a more detailed look at the need for HRIS:

1. Managing Employee Information:

- **Centralized Database:**
  HRIS systems provide a central repository for all employee data, eliminating the need for multiple spreadsheets and paper-based systems.
- **Improved Accuracy and Accessibility:**
  By centralizing data, HRIS systems reduce errors and ensure that information is readily accessible to authorized users.
- **Tracking Changes:**
  An HRIS can track changes to employee data, such as promotions, salary adjustments, and contact information, ensuring a complete and up-to-date record.

2. Automating HR Processes:

- **Payroll Management:**
  HRIS systems automate payroll processing, reducing manual effort and potential errors.
- **Benefits Administration:**
  They streamline the process of enrolling employees in benefits plans, managing enrolments, and tracking benefit utilization.
- **Time and Attendance:**
  HRIS can track employee time and attendance, simplifying timekeeping, and leave management.

3. Supporting Compliance:

- **Regulatory Compliance:**
  HRIS systems help organizations stay compliant with various labour laws and regulations by tracking required data and automating reporting.
- **Data Security:**
  They offer robust security features to protect sensitive employee data and ensure compliance with data privacy regulations.

4. Enhancing Efficiency and Productivity:

- **Reduced Manual Effort:**
  By automating tasks and streamlining processes, HRIS systems free up HR professionals to focus on more strategic initiatives.

- **Improved Reporting and Analytics:**
  HRIS systems provide valuable insights into HR metrics, helping organizations make data-driven decisions.
- **Improved Employee Experience:**
  Self-service portals allow employees to manage their own information, submit requests, and access HR-related information, improving their overall experience.

5. Supporting Strategic HR:

- **Talent Management:**
  HRIS systems can support talent acquisition, performance management, and employee development initiatives.
- **Workforce Planning:**
  By providing access to accurate data and analytics, HRIS systems can help organizations plan for future workforce needs.
- **Employee Engagement:**
  HRIS systems can contribute to a more positive and engaging work environment by streamlining processes and providing employees with better access to information.
  In conclusion, HRIS systems are essential for modern organizations, offering numerous benefits in terms of data management, process automation, compliance, and overall efficiency. They are not just about managing employee information; they are about optimizing HR operations and supporting the organization's strategic goals.

The Need for an HRIS in Today's Workplace

The need for HRIS arises from the fact that it can help automate and streamline several time-consuming and resource-intensive day-to-day tasks. HR information systems may also reduce administrative expenses by eliminating manual processes, boosting accuracy and productivity, and improving data quality.

It can also provide HR leaders with more comprehensive insights, allowing them to make better-informed decisions while promoting an employee-centric business strategy. Similarly, software users can measure and analyze employee engagement, efficiency, and various other important metrics more precisely.

HR information systems offer an organized, efficient, and centralized repository for managing staff records, perks, and payroll. It also helps to monitor employee performance and attendance.

The need for HRIS is now widely recognized because it helps in:

- **Managing multiple HR processes**: As an HR executive, you can structure your work more efficiently than in the past. And your organization can be more systematic in the manner in which it controls employee information. Employees can also manage HR-related tasks like self-reviews and benefits selection more easily, improving the employee experience.
- **Maintaining transparency across stakeholders**: You could have various stakeholders in an organization and a large number of full-time and part-time HR employees. It is difficult to maintain a balance while keeping everyone informed. With an effective HRIS, you can curb uncertainty by offering only a centralized, single point of information for all HR-related data.

- **Reducing your efforts through automation**: While being more organized is great, you can also optimize your work. Human resource information systems ensure that managers refrain from duplicating tasks and can instead focus on employee experiences. An HRIS streamlines your work via automation.

Transforming HR with HRIS: Enhancing the Employee Experience

By now, we have understood that one of the key needs for HRIS is that it makes life easier for HR leaders. And, it also engages employees and provides them with a better experience. How exactly does it achieve this?

Why is a human resource information system essential for positive employee experiences? Here are the top reasons:

1. Improve experiences across the entire employee lifecycle

When HRIS is applied to recruitment, applicants may feel more connected right from the outset. They can submit an application and view its status without requiring manual intervention or phone calls. This not only helps individuals feel empowered, but it can also provide managers with insights into how candidates behave when given more autonomy.

The benefits of HRIS are seen across the employee lifecycle. For instance, having an HRIS means that you have a centralized data store to keep and analyze the results from **exit interviews.**

2. Enables closer communication between the management and the workforce

Modern HRIS software lets employees and senior management speak freely and interact with one another. This allows employees to express their thoughts more frequently, make suggestions and share feedback. These open channels of communication can help individuals participate more directly and understand that their opinions matter.

3. Removes doubts and bottlenecks during performance reviews

Performance management is built into most modern human resource information systems. It helps in defining precise deadlines, a well-defined reward and recognition system, and an overview of progress.

Employees can better fully understand how they can contribute to the business when the organization's objectives are unambiguously highlighted in the HRIS software. The software will also remind employees of performance goals, making it easy to stay focused. An HRIS may minimize the likelihood of performance review conflicts by basing decisions purely on data.

4. Empowers employees with self-service and mobile applications

By using an HRIS, employees can review their unused leave balances and personal data. In addition, they can request time off and amend details like their home address.

Because the majority of HRIS systems are hosted on the cloud, people can access them from their mobile devices or laptops. This allows them to finish administrative tasks during usual downtimes, like travel or en route to a meeting.

It also means staff members working remotely or traveling on business may file expenses, ask for time off, or refresh their banking information, no matter their location. As a result, the overall employee experience improves for every member of the workforce, underscoring the need for HRIS in remote and **hybrid work** scenarios.

5. Rewards employees for their efforts

An HRIS helps HR leaders and administrators monitor employee output. Consequently, they are also better able to recognize employees for their achievements. Simply saying "Well done!" can help workers feel more appreciated. Managers can also discuss incentives or

rewards for empowered actions and outstanding achievements. Using self-service, employees can choose from a bouquet of reward options, further elevating their experience.

6. Eliminates friction from employee workflows

One of the immediate repercussions of globalization on businesses is that today's workers demand simplicity, speed, and efficiency. Organizational management, recruiting, office administration, time management, and talent management are all handled by an HRIS. It also functions as an HR portal that provides access from any interface at any point in time.

This tool's versatility and usability offer employees a positive outlook on the duties they must carry out and increase their productivity.

Let’s say a hybrid working employee wants to switch their in-office days from Tuesday to Thursday for a couple of weeks, inputting, approving, reconciling, and adjusting this data would take a long time without an HRIS. A human resource information system (particularly when hosted on the cloud) makes these modifications in a matter of hours, also updating schedules so that team productivity is not compromised.

7. Minimizes admin work for employees and managers

Life as an administrator can feel challenging, but with an HRIS, tasksthat would otherwise be repetitive or easily overlooked are streamlined.

Using an HRIS, leave requests, notifications of unanticipated absences, and training progression can all be monitored and recorded. Automatic alerts can serve as an advisory to the manager or staff member to complete required duties such as submitting a **travel and expense** form after a business trip.

HR information systems may improve and expedite tasks like pay slips and invoicing. There is no requirement to look for and save files in new locations. When freed from administrative duties, HR professionals can focus on more engaging work or quality family time.

8. Foster a culture of transparency

An HRIS can significantly enhance operational transparency, which can promote employee engagement.

It enables the centralized posting of company strategies, regulations, developments, or notifications. This provides employees with quick access to the most current versions of these documents. Using an HRIS aids in awareness of societal changes within an organization. This may involve HR departments adopting more inclusive hiring practices or fostering greater workplace diversity.

This increased accessibility can be advantageous in several ways. First, it tells employees that the organization has nothing to hide. It may also limit inaccuracies and disinformation, gossip, and office politics, which can be terrible for employee experiences.

Instead, employees can quickly validate their points of view by referencing the applicable guideline or amendments in the HRIS.

Meeting the Need for HRIS Automation

There is an increasing need for HRIS automation because the two-way data flow system can trigger actions such as sending a file for approval, sending a reminder, updating data, and so on.

Here are some of the considerations to remember as you meet the increasing need for HRIS automation in your company:

- **Start with repetitive tasks that you cannot do without**: Tasks that must be performed repeatedly and are vital to the organization's long-term viability can be a good fit for automation. This group of tasks include, for example, the processing of fixed-rate salaries. When they can be electronically computed or processed, there is hardly any reason for an HR manager to manually input the same values, data, or calculations every week.
- **Standardize the data source that feeds the automated workflow**: When employees can submit inquiries and applications electronically, this data goes directly into their personnel files. Standardizing staff records in the HRIS diminishes the possibility of errors.

- **Take the need for HRIS automation to reinforce security**: If confidential employee or business information passes through far more hands than necessary, it becomes increasingly vulnerable to theft or other threats. When information is harvested digitally, it's more protected than when it is physically extracted from paper forms that anybody can access.

- **Find processes that can actually benefit from HRIS automation:** Sometimes, HR processes become genuinely better and not just more efficient when automated. For instance, an HRIS can send out alerts based on compliance actions. It allows you to be more proactive instead of asking an HR leader to manually examine the system to ensure compliance with all applicable rules.

Benefits of a cloud HRIS system

In addition to the basic functionality of a modern HRIS, cloud-based systems are more easily integrated with your existing systems. They are scalable and can more readily be augmented by new innovations and security features.

Below are just a few of the common benefits of an integrated cloud HRIS system:

- **Makes HR admin faster and more accurate.** When dealing with people's livelihoods, there's no margin for error. With its ability to automate and streamline admin tasks, HRIS software can free HR teams up from the delays and inaccuracies brought on by manual and paper-based systems.
- **Improves employee experience**. Employers sometimes forget how important it is to their teams to be able to see the status of their benefits, payments, and time off. HRIS tools allow employees to directly access their personal information, produce reports, and issue requests – all without the inconvenience and time it takes to go through the HR department.
- **Improves efficiency**. HRIS solutions offer a wide range of self-service tools that greatly minimise the need for email and paper-based forms and approval processes. Schedules, workflows, time-off requests, and more – can be automated and managed in real time, and on the fly.
- **Supports compliance efforts**. With a rise in remote work and a cultural shift toward greater sensitivity and litigation, businesses need to be sure they're on the right side of global labour and employment regulations. Cloud HRIS helps to ensure that all HR activities fall within the boundaries of compliance and help to support their workforces.
- **Keeps things secure**. Within HR files are some of the most sensitive and precious data in your company – including employees' medical and financial records and details. In the past, when this data was stored on laptops or unsecured databases, there was an ever-present risk of compromise. Today's integrated HRIS systems have advanced security protocols built in to help minimise cybersecurity risks.

Types of HRIS and their use cases

All HR information systems fall into five main types based on function or scope:

1. Operational HRIS
2. Strategic HRIS
3. Tactical HRIS
4. Comprehensive HRIS
5. Limited-function/specialized HRIS

Both limited-function and comprehensive HRIS solutions may house different quantities and types of data that fall across the three different functional types of information systems.

1. Operational HRIS

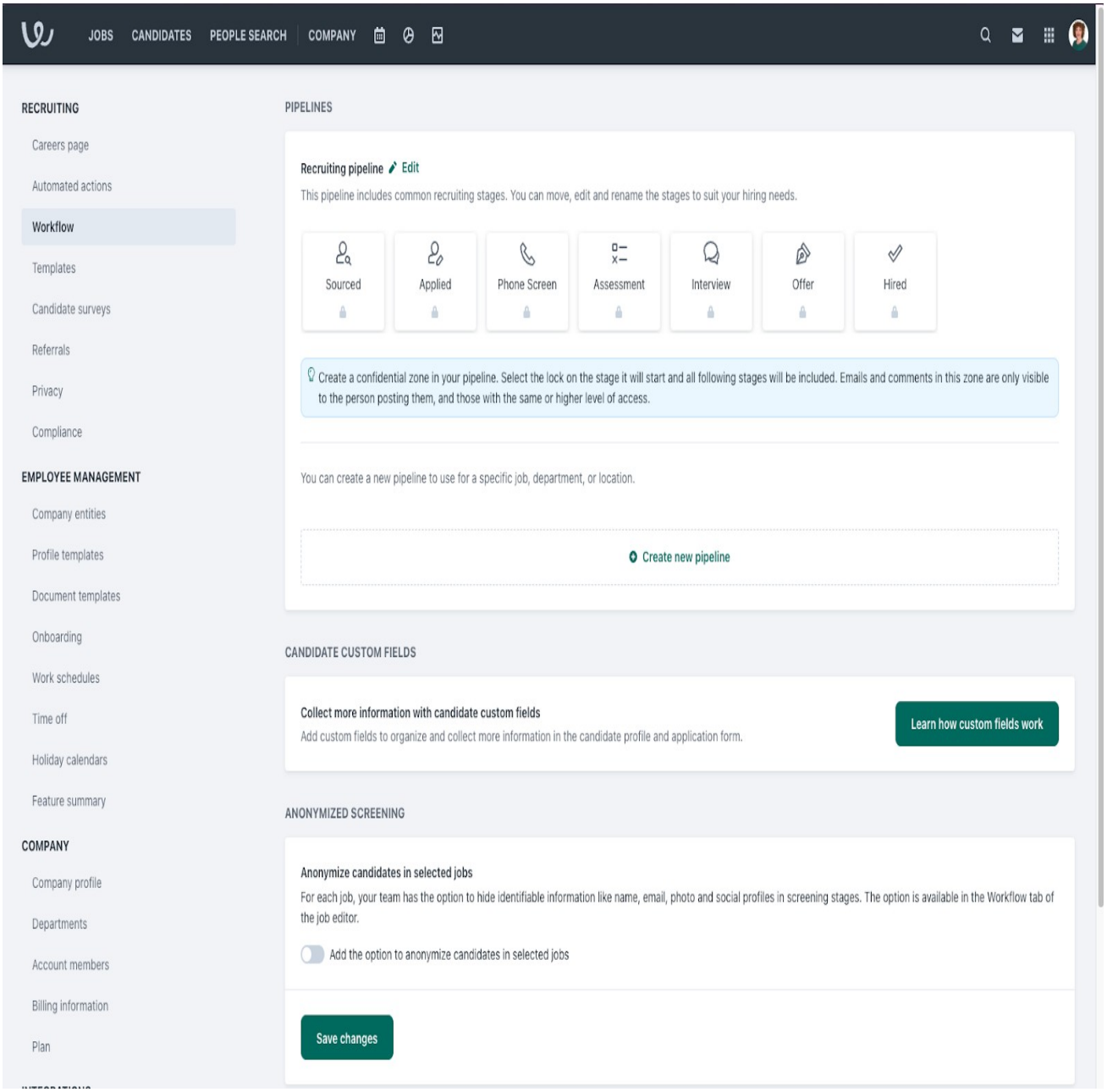
The operational HRIS category includes tools that assist HR staff and people managers with hiring, promotions, transfers, and other talent management needs. Operational HRIS solutions focus on improving existing systems by making them more efficient and impactful.

Applicant tracking system (ATS)

An applicant tracking system (ATS) logs all open positions within an organization and optimizes workflows to fill them as quickly as possible. ATS functions include syndicating job postings to multiple job boards, screening applications to identify qualified candidates, and identifying bottlenecks within the hiring process.

Example

Workable automates tasks like publishing job posts, sorting applicant résumés, and scheduling interviews. Automating these tasks helps streamline the screening and recruitment process, increases efficiency, and reduces the chances of human error.



Workable's workflow management feature includes a customizable pipeline that HR professionals can use to simplify the screening and recruitment process.

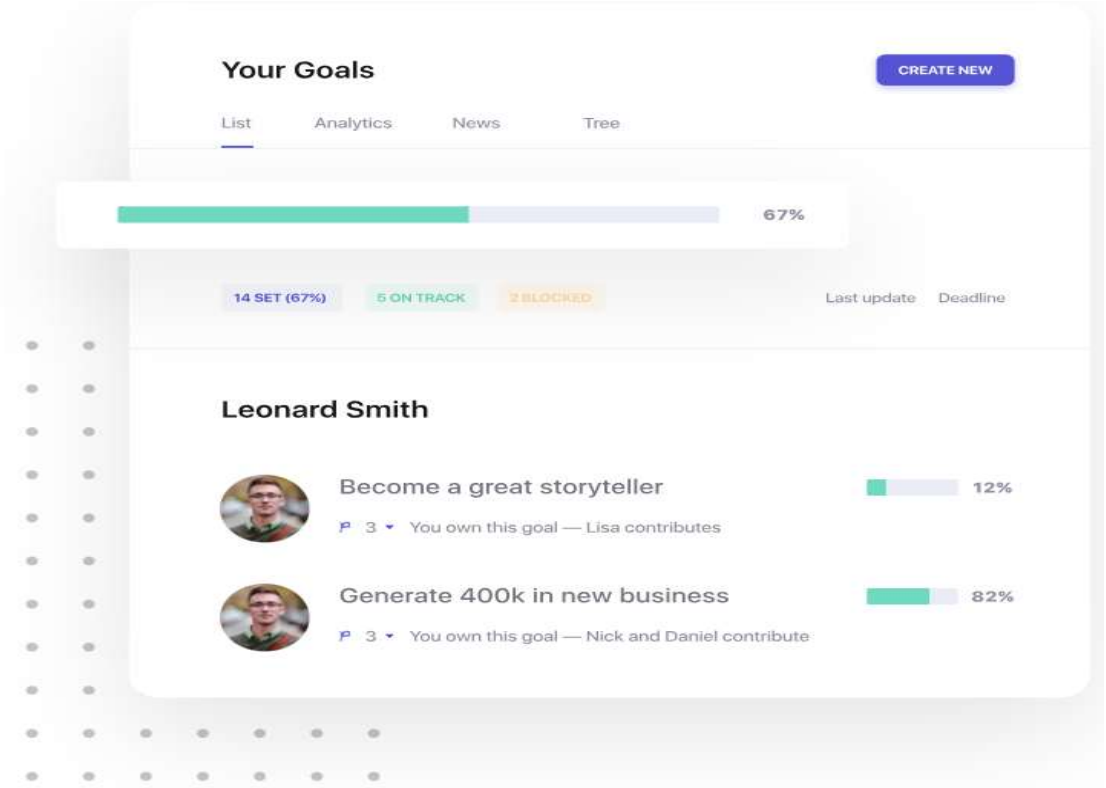
Performance management system

A performance management system stores employee information regarding performance appraisals. It supports employee retention, promotion, transfer, job rotation, contract termination needs, and other talent management concerns. A performance management system helps managers take action if an employee is under-utilized or needs extra support.

Example

An integral part of a performance management system is conducting regular performance reviews to identify employee strengths and areas of opportunity. To help streamline this process, Leapsome automates review cycles and allows employees to set and track personal and organizational goals.

The performance appraisal feature collects and provides the data and documentation necessary to make critical decisions regarding employee retention. This includes deciding whether to retain, promote, transfer, or terminate an employee.



Leapsome helps employees create goals and monitor progress for an easier way to track employee growth and development.

2. Strategic HRIS

Modules and functions within strategic HRIS systems help with analysis, decision-making, and goal-setting in relation to human capital management. Strategic HRIS solutions often help companies plan for growth and expansion by finding and retaining the right talent.

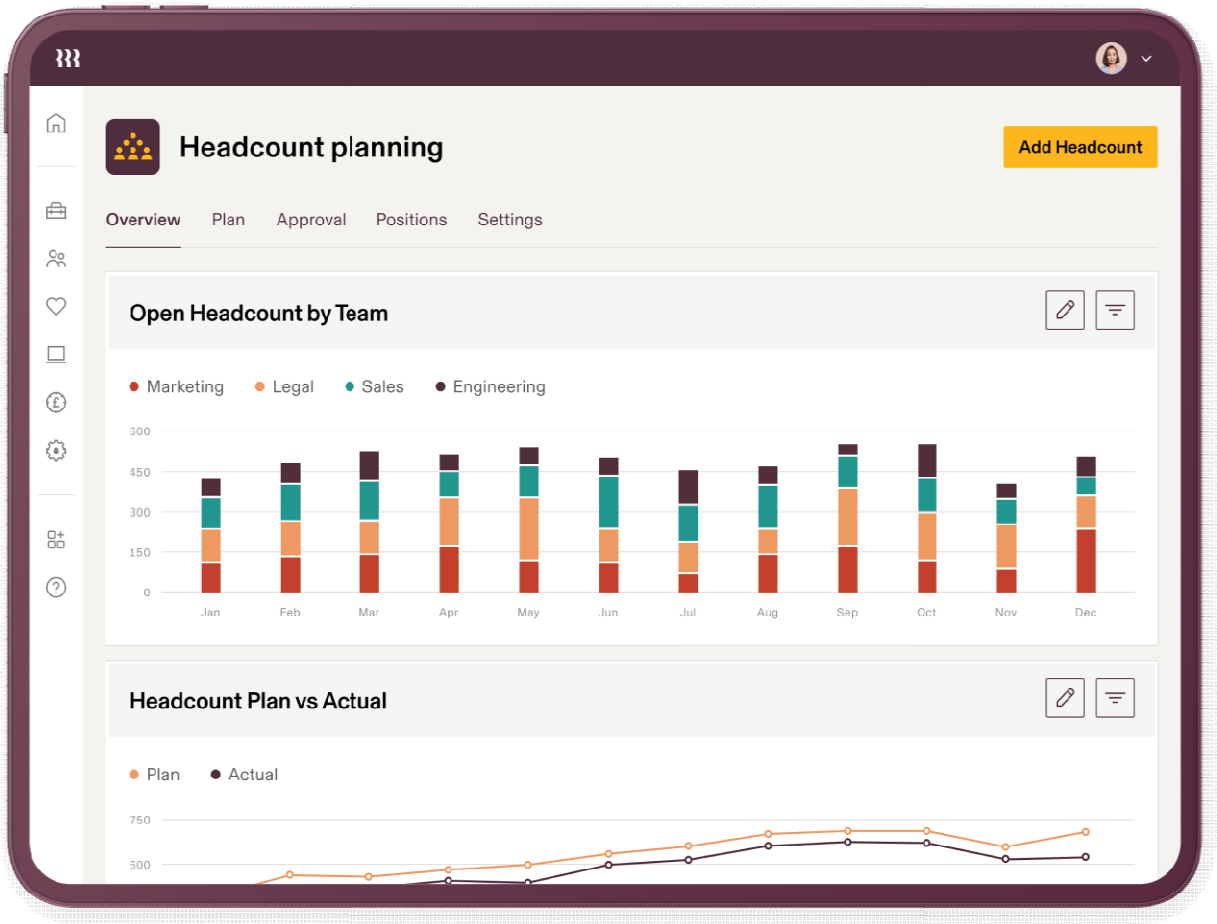
Workforce planning

Workforce planning tools help HR teams identify the necessary background and skills, responsibilities, reporting structure, and salary for any given role. This functionality helps develop strategies for filling skills and role gaps in the current workforce, which has downstream implications for recruiting strategies as well as learning and development plans.

Example

Rippling's headcount planning creates approval workflows and helps you budget for current and future employees. This gives you a quick view of the actual headcount and allows you to compare it against the planned headcount. You can also view the number of headcount in each phase of the hiring process, as well as the range of total compensation and annual bonus.

Rippling's headcount planning module aids in planning for company growth and expansion by clarifying the costs related to necessary positions. Understanding these data allows for effective budgeting for crucial roles.



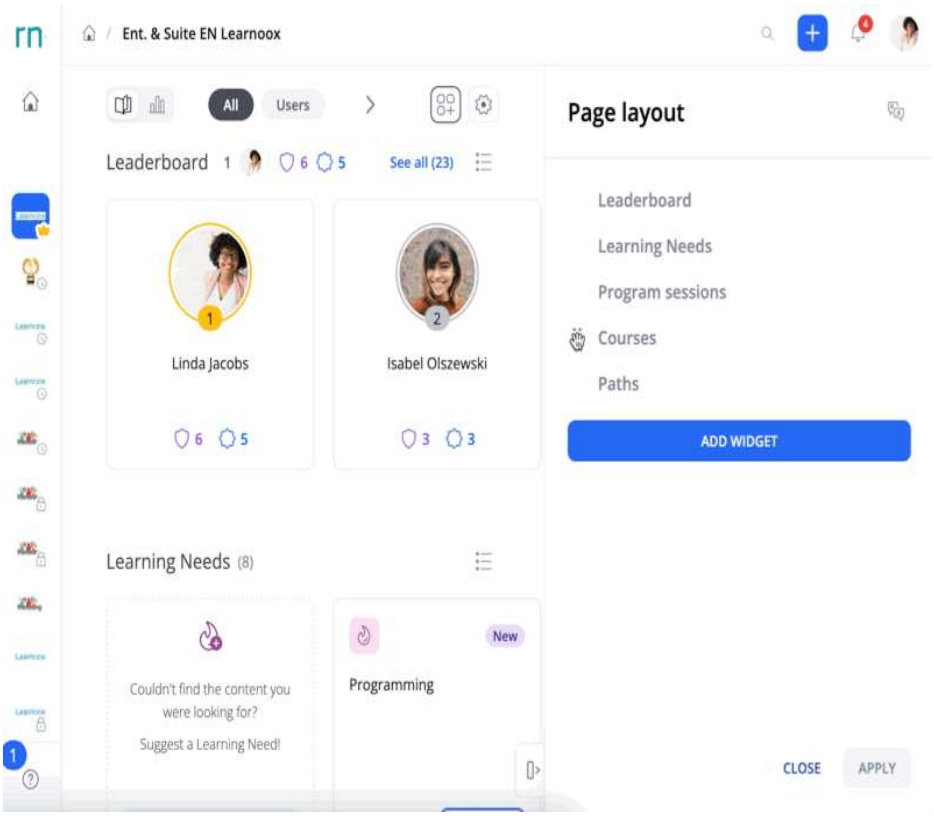
Rippling provides managers with a visual representation of headcount data by team, which can be beneficial in planning for the company's growth and in making informed decisions.

Learning management system

A learning management system (LMS) supports succession planning as operational decisions are made regarding job rotations or promotions. It tracks skill sets for employees across the company and identifies employees who are ready to pursue additional training or certifications based on recent changes to their roles or responsibilities.

Example

360Learning helps you create a course that supports different content types, incorporates gamification elements to increase user engagement, and allows managers track learners' progress. These features significantly enhance learning management within a strategic HRIS because they align employee development with company goals and prepare them for future company needs.



360Learning allows administrators to tailor page layout by adding or moving around widgets to enhance employee learning and engagement.

3. Tactical HRIS

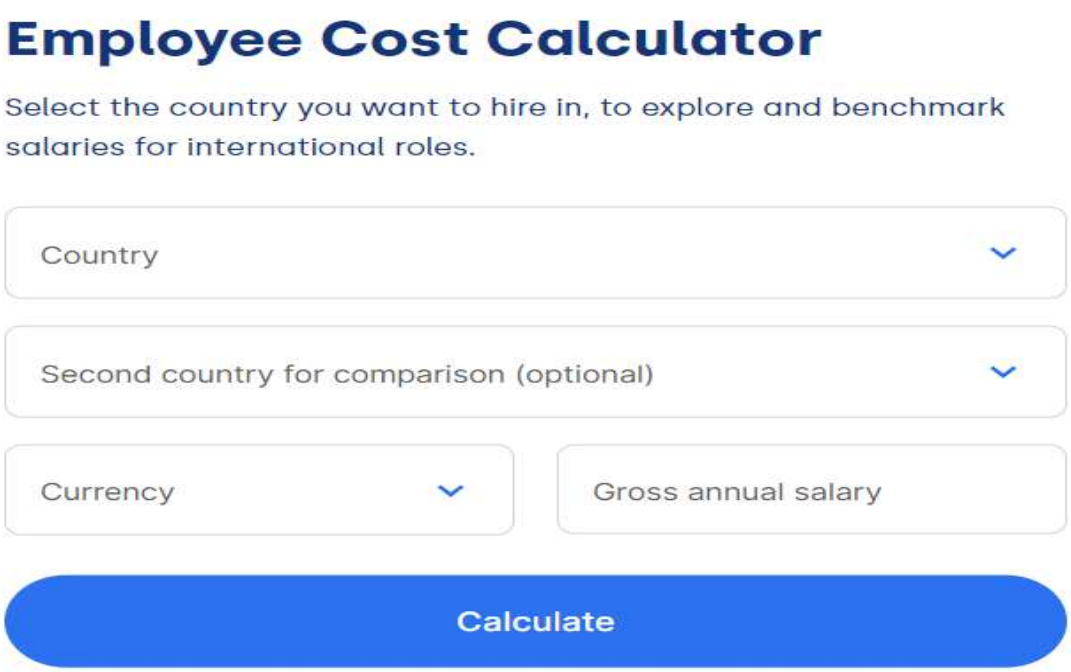
The tactical HRIS category targets efficiency and compliance for internal workforce management. The tools and functionalities that fall in this category help HR leaders make decisions on how to best use existing resources for functions such as compensation, recruiting, training, and benefits.

External data aggregation

Tactical human resource modules aggregate external data related to a business's competitors, industry, and compliance requirements. This information provides benchmarks in areas such as talent acquisition, employee satisfaction, compensation, DEI, and performance management.

Example

Deel tracks compensation data across international markets to help determine whether a proposed payment rate is higher, lower, or on-par with similar roles in a specific geographic region.



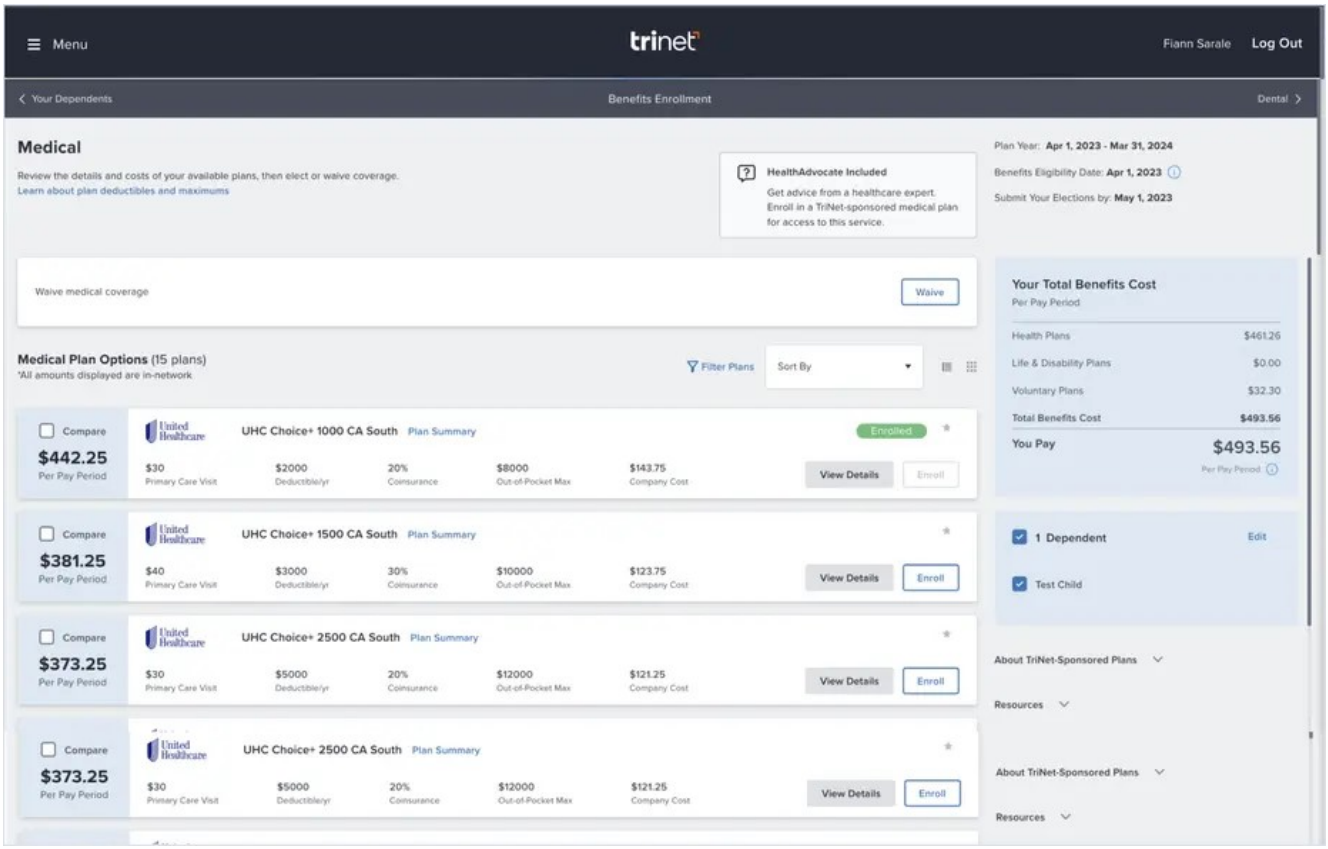
Deel's employee cost calculator helps benchmark salaries for specific roles across the globe. Source: Deel

Benefits administration system

Compensation and benefits management impact employee experience and are two of the largest business expenses. Company leaders have a vested interest in regularly reviewing the organization's benefits package as part of an employee's total compensation. If an HRIS indicates a particular benefit is being underutilized among employees, HR leaders may need to remind employees about the benefit or decide to invest in a different benefit instead.

Example

TriNet helps users identify how employees are utilizing company benefits. If you find that a benefit is not being utilized effectively, you can also use TriNet's marketplace to compare benefits and find one that supports your employees' specific needs.



TriNet helps employees pick the right benefits through its benefits decision support tool. Source: TriNet
Visit TriNet

4. Comprehensive HRIS

As the name implies, a comprehensive HR information system functions as a one-stop shop for storing any information needed to perform nearly all HR management functions. It serves as a central repository for a wider range of data that supports operational, strategic, and tactical HR functions combined.

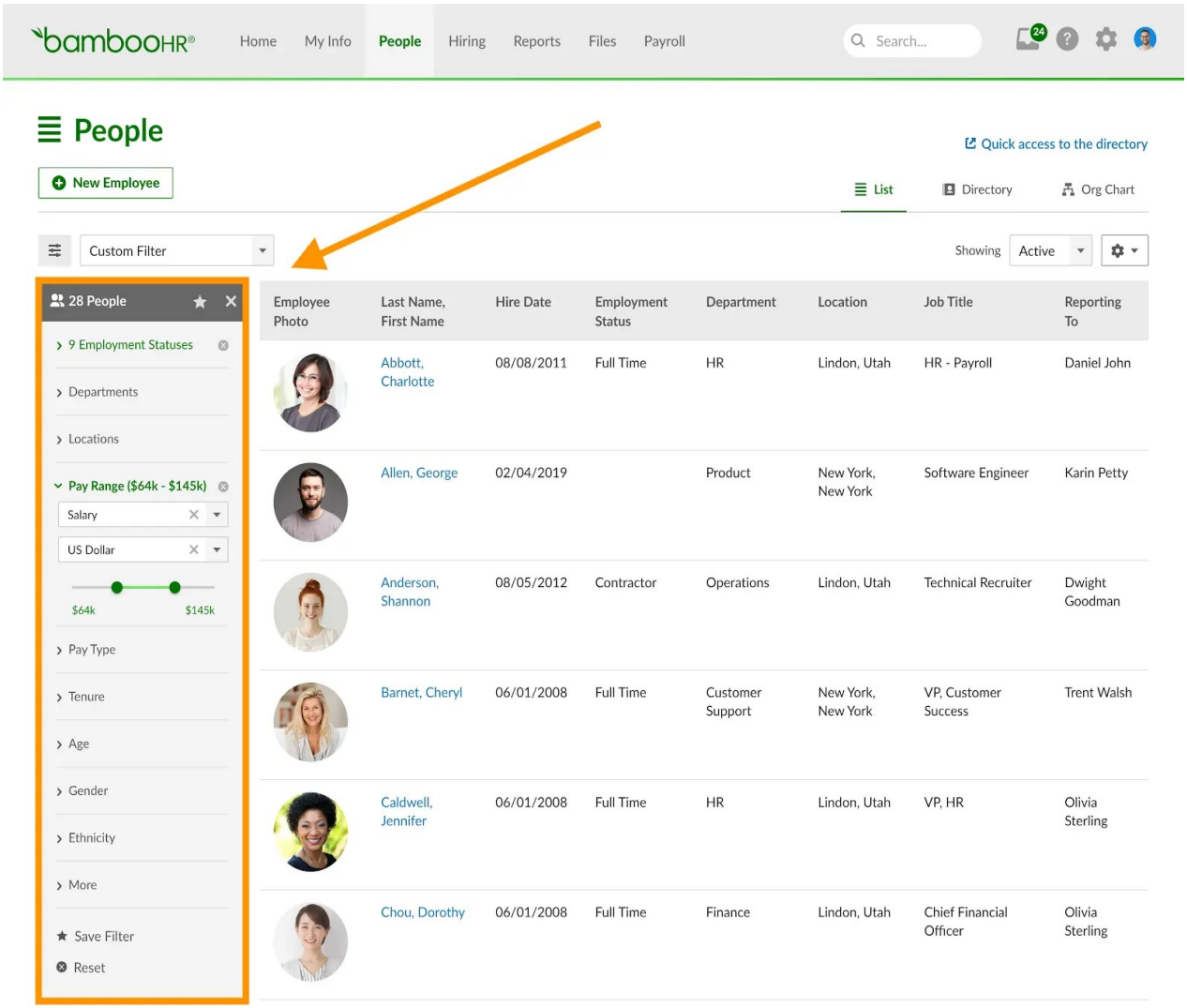
These three functions don't operate in a vacuum; rather, they influence each other in different ways. For example, information about where a role fits into the reporting structure and how it contributes to the company's goals serves both operational and strategic angles of job analysis and design.

It makes sense for larger businesses to use a comprehensive HRIS since it consolidates data across all three types of functional systems. This information provides valuable insight so HR and business leaders can make informed decisions quickly.

Smaller businesses, on the other hand, may want a simpler HRIS platform that fulfills only core human resources management needs such as payroll. In this case, a comprehensive HRIS may be overwhelming to implement and maintain. The higher cost also puts all-in-one HR suites out of reach for many smaller businesses' budgets.

Example

BambooHR is a popular all-in-one tool with HRIS key features to support onboarding, performance management, payroll, and benefits administration.



BambooHR saves employee information and allows HR professionals to create custom filters.

5. Limited-scope or specialized HRIS

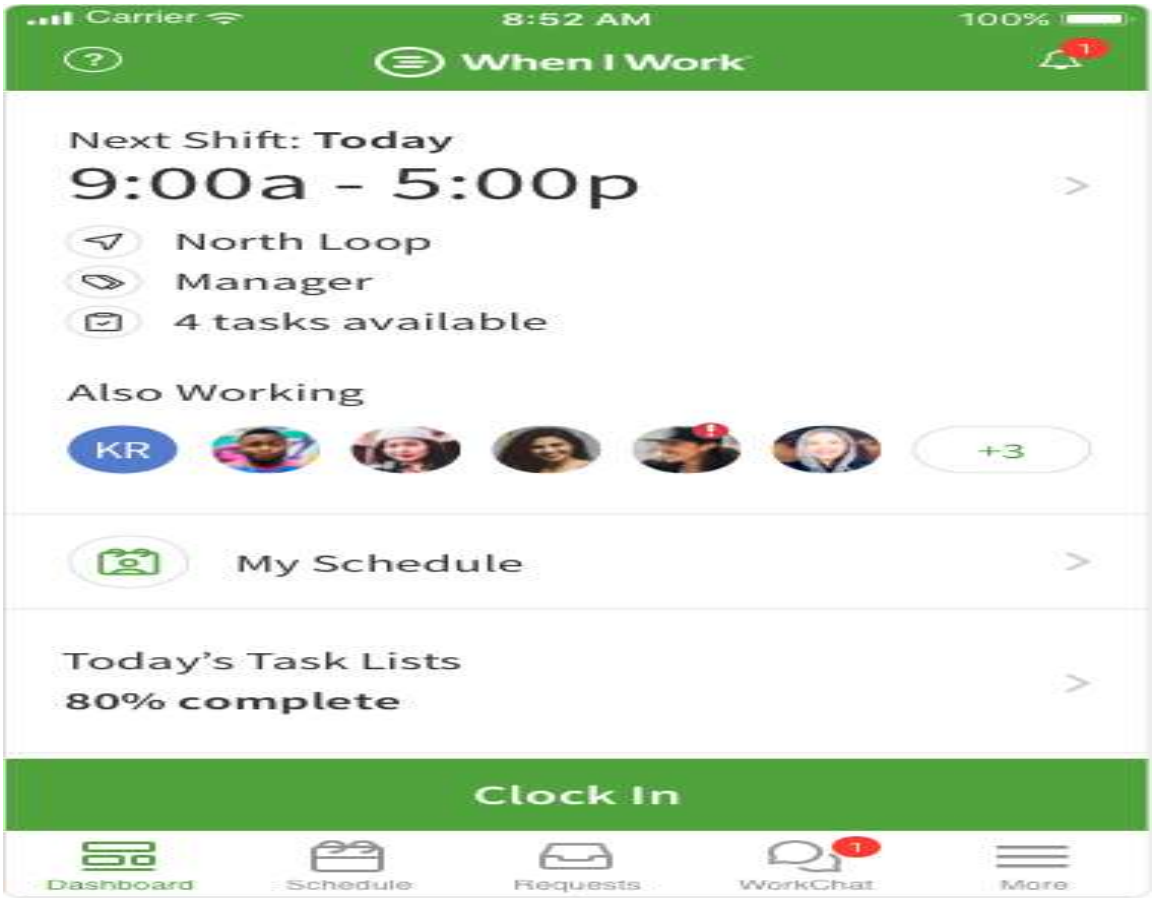
In contrast to a comprehensive HRIS, a limited-function HRIS focuses on one or a few core information systems. They typically support a narrow list of HR functions, such as payroll and benefits administration and are a better investment for businesses' with specific tactical needs that can't be addressed by an all-in-one solution.

No matter what HR function(s) a company focuses on with a limited-function HRIS, an employee information system is essential to the HR software. This system collects, archives, and tracks personal and professional employee records, including name, address, minority status, citizenship, education, and past professional experiences.

Limited-function HRIS platforms are often less expensive compared to comprehensive HRIS solutions, and solo HR professionals can manage this kind of software alone. For these reasons, small companies with lean HR teams may find limited-function HRIS platforms more manageable.

Example

When I Work focuses on workforce management and is best for organizations that need to effectively schedule shifts. When I Work's more advanced features, like automatic scheduling and labor costing, make it a better option for companies with primarily frontline workers compared to comprehensive HR without these specialized abilities.



When I Work's mobile app allows managers and employees to view, make, and request schedule changes easily through its user-friendly mobile app.

How to choose the right type of HRIS

There are many HRIS solutions available that fit a wide range of needs, so the quest to find the best fit comes down to two questions:

- What kind of HR management functions does the business need?
- How will it use the data it collects from those processes?

Choose limited-scope HRIS if:

- Your business needs an HRIS that specifically covers:
- **Operational HRIS** to help develop your company's current workforce.
- **Strategic modules** to support your company's growth and succession planning efforts.
- **Tactical modules** to help you house data so that HR can make informed decisions about how to best use its existing resources.
- You require a standalone solution with more advanced features for particular needs that a comprehensive HRIS does not cover.

Choose comprehensive HRIS if:

- As a company, your data grows in terms of both quantity and type.
- If you value efficiency and strategic insights over a bigger financial investment.

Ultimately, the right type of HRIS depends on the unique needs your company faces now and in the future. Keep these needs top of mind as you explore our comprehensive list of solutions in our HR Software Guide.

HRIS (Human Resources Information System) needs analysis

An HRIS (Human Resources Information System) needs analysis is a crucial process for organizations to understand their current HR capabilities and future requirements before implementing or upgrading an HRIS. This analysis helps identify gaps in existing processes, define specific needs, and ensure the chosen system aligns with strategic goals and business objectives. It involves evaluating current HR processes, identifying pain points, and determining the features and functionalities needed from an HRIS to address those issues and improve overall efficiency.

Key Aspects of an HRIS Needs Analysis:

- **Assessing Current HR Processes:**
  This involves evaluating existing HR workflows, data management practices, and the effectiveness of current HR systems.
- **Identifying Pain Points and Inefficiencies:**
  Pinpointing areas where current processes are slow, inefficient, or prone to errors, such as manual data entry, lack of integration, or delayed payroll processing.
- **Defining System Requirements:**
  Determining the specific features and functionalities needed from the HRIS to address identified needs and support strategic goals, such as improved employee engagement, streamlined recruitment, or enhanced compliance.
- **Stakeholder Alignment:**
  Ensuring that HR, IT, finance, and management are all aligned on the system requirements to avoid conflicting priorities during implementation.
- **Cost Considerations:**
  Evaluating the potential costs associated with not implementing an HRIS or choosing an inadequate system.
- **Future-Proofing:**
  Considering the organization's future growth and scalability requirements when selecting an HRIS.

  Benefits of Conducting a Thorough HRIS Needs Analysis:
- **Improved HR Efficiency:**
  Streamlining HR processes, reducing manual tasks, and automating workflows can significantly improve HR efficiency and productivity.
- **Enhanced Data Accuracy and Reporting:**
  A well-defined HRIS can improve data accuracy, provide better reporting capabilities, and support informed decision-making.
- **Better Compliance:**
  HRIS systems can help organizations stay compliant with labor laws and regulations by managing employee data and tracking compliance requirements.
- **Reduced Costs:**
  By identifying and addressing inefficiencies, an HRIS can help organizations reduce costs associated with manual processes, errors, and compliance issues.
- **Improved Employee Experience:**
  An effective HRIS can improve the employee experience by providing self-service options, streamlining HR processes, and improving communication.
- **Strategic Alignment:**
  An HRIS that is aligned with organizational goals can support strategic initiatives such as talent management, workforce planning, and organizational development.

  By conducting a thorough HRIS needs analysis, organizations can make informed decisions about their HR technology investments and ensure that the chosen system effectively supports their HR functions and contributes to overall business success.

In today's fast-paced business environment, aligning technology with organizational goals is essential for success. For human resource departments, selecting the right Human Resource Information System (HRIS) is a critical decision that can significantly impact operational

efficiency and employee satisfaction. However, to ensure that the chosen HRIS truly meets the organization's needs, a thorough HRIS needs assessment is indispensable.
An HRIS needs assessment is a systematic process that helps organizations identify their specific HR technology requirements, aligning them with broader business goals. By conducting this assessment, companies can avoid costly mistakes, streamline the HRIS system selection process, and ultimately implement a solution that delivers real value.

Understanding the Basics of HRIS Needs Assessment

Definition and Purpose of an HRIS Needs Assessment

An HRIS needs assessment is a detailed analysis aimed at identifying the specific requirements of an organization's HR department. This process involves evaluating existing HR processes, identifying gaps or inefficiencies, and determining the features and functionalities that a new HRIS must possess to address these issues. The primary purpose of an HRIS needs assessment is to ensure that the selected system aligns with the organization's strategic goals and can support its long-term growth.

How It Differs from General Software Evaluations

While a general software evaluation might focus on comparing different solutions based on their features and pricing, an HRIS needs assessment is more focused on understanding the unique needs of the HR department and the organization as a whole. It involves a deeper dive into current HR processes, user requirements, and long-term objectives. This targeted approach ensures that the HRIS selected is not just a good software solution but the right solution for the specific challenges and goals of the organization.

Pre-Assessment Preparation

Proper preparation is key to conducting an effective HRIS needs assessment. This phase involves assembling the right team and setting clear objectives for the assessment.

Assembling the HRIS Assessment Team: Key Roles and Responsibilities

The success of the HRIS needs assessment largely depends on the team conducting it. The team should include key stakeholders from various departments, such as HR, IT, finance, and operations. Each member brings a unique perspective that can help ensure a comprehensive assessment. Key roles might include:

- **HR Lead:** Focuses on HR processes and user needs.
- **IT Specialist:** Assesses technical requirements and integration capabilities.
- **Finance Representative:** Evaluates cost implications and ROI considerations.
- **Project Manager:** Oversees the process, ensuring that timelines are met and objectives are achieved.

Setting Clear Objectives for the New HRIS

Before starting the assessment, it's crucial to define what you want to achieve with the new HRIS. Objectives might include improving efficiency, enhancing compliance, automating specific HR functions, or supporting future growth. Clearly defined objectives will guide the assessment process and help prioritize the features and capabilities needed in the new system.

Key Questions to Drive the Assessment

The HRIS needs assessment should be guided by key questions that help identify the organization's current challenges and future requirements.

What Are the Current Pain Points with Our Existing HRIS or HR Processes?

Understanding the limitations of your current HRIS or manual HR processes is the first step in identifying what needs to be improved. Are there inefficiencies in payroll processing, challenges with compliance, or difficulties in managing employee data? Identifying these pain points will highlight the areas where a new HRIS can add the most value.

Which HR Functions Are We Looking to Improve or Automate?

Determine which specific HR functions you want to enhance or automate with the new system. This could include recruitment, onboarding, performance management, or employee self-service. Knowing which areas to focus on will help narrow down the features and functionalities required in the HRIS.

What Are Our Must-Have Features Versus Nice-to-Have Features?

Not all features are equally important. Distinguish between must-have features—those that are essential for meeting your objectives—and nice-to-have features that would be beneficial but are not critical. This distinction will help in making informed decisions during the selection process.

How Do We Anticipate Our Needs Evolving Over the Next 5-10 Years?

Consider the long-term needs of your organization. As your company grows or evolves, your HR requirements may change. An effective HRIS needs assessment should take into account potential future needs, ensuring that the selected system can scale and adapt over time.

Data Collection Methods

Gathering accurate and comprehensive data is a crucial part of the HRIS needs assessment. Various methods can be employed to collect the necessary information.

Surveys and Questionnaires to Gather Feedback from End-Users

Surveys and questionnaires are effective tools for gathering input from those who will be using the HRIS daily. These tools can provide insights into user preferences, pain points, and desired features, helping to ensure that the new system meets the needs of all stakeholders.

Interviews and Focus Groups with Stakeholders

Conducting interviews and focus groups with key stakeholders allows for more in-depth discussions about the current HR processes and what improvements are needed. This qualitative data can reveal insights that might not be captured through surveys alone.

Analyzing Existing HR Data and System Usage Patterns

Reviewing existing HR data and system usage patterns can provide valuable information about how current processes are functioning. This analysis can help identify inefficiencies, bottlenecks, or underutilized features, guiding the focus of the new HRIS.

Evaluating Business Requirements

Once the data is collected, it's time to evaluate the business requirements that the new HRIS must meet.

Aligning HR Goals with Overall Business Strategies

The HRIS should support the broader business strategy. For example, if your organization is focusing on growth, the HRIS should be able to scale accordingly. If compliance is a priority, the system must have robust reporting and auditing capabilities. Aligning HR goals with business strategies ensures that the HRIS contributes to the organization's overall success.

Identifying Integration Needs with Other Business Systems

The HRIS will need to integrate with other business systems, such as payroll, finance, and ERP. Identifying these integration needs early in the assessment process will help avoid compatibility issues and ensure a seamless flow of data across the organization.

Considerations for Scalability, User Accessibility, and Compliance

Scalability, user accessibility, and compliance are critical factors in evaluating HRIS solutions. The system should be scalable to accommodate future growth, accessible to all users regardless of location, and compliant with relevant laws and regulations. These considerations are essential for ensuring the long-term success of the HRIS.

Documenting the Assessment Findings

Effectively documenting the findings of the HRIS needs assessment is crucial for guiding the HRIS selection and implementation processes.

How to Effectively Document Needs and Expectations

The assessment findings should be documented in a clear, organized manner. This documentation should include a detailed list of requirements, user needs, integration points, and any other critical information. Use tables, charts, and diagrams to visualize the data where appropriate, making it easier to communicate the findings to stakeholders.

Creating a Prioritized List of Requirements

Based on the assessment, create a prioritized list of requirements. This list should categorize features into must-haves, nice-to-haves, and optional functionalities. Prioritization helps ensure that the most critical needs are met first, while also providing a framework for evaluating potential trade-offs during the selection process.

Using the Findings to Inform Your HRIS Vendor Selection Process

The documented assessment findings will serve as the foundation for your HRIS vendor selection process. Use the requirements list to evaluate vendors, focusing on how well each solution meets your specific needs. This approach ensures that you select a system that is tailored to your organization's unique requirements.

Using the Assessment in Vendor Selection

The HRIS needs assessment plays a crucial role in the vendor selection process, helping to ensure that the chosen system aligns with your organization's needs.

How to Use the Needs Assessment to Guide Demos and Vendor Evaluations

Use the findings from the needs assessment to create scenarios or scripts for vendor demos. These scenarios should reflect your most critical requirements, allowing you to see how each vendor’s solution handles real-world situations that your organization might face. This practical approach ensures that you evaluate vendors based on how well they meet your specific needs.

Developing Scenarios or Scripts Based on Your Most Critical Requirements

Developing detailed scenarios or scripts based on your prioritized requirements allows you to test the system’s capabilities during vendor demonstrations. These scenarios should cover a range of use cases, from routine HR tasks to complex workflows, ensuring that the system can handle all aspects of your HR operations.

Questions to Ask Vendors That Are Directly Informed by Your Assessment Findings

Prepare a list of questions for vendors based on the findings of your needs assessment. These questions should focus on key areas such as integration capabilities, scalability, user experience, and compliance. Asking the right questions helps you gather the information needed to make an informed decision.

Next Steps After a Needs Assessment

After completing the HRIS needs assessment, the next step is to translate the findings into an actionable implementation plan.

How to Translate Assessment Outcomes into an Actionable HRIS Implementation Plan

Use the assessment findings to create a detailed implementation plan. This plan should outline the steps required to select, purchase, and implement the new HRIS, including timelines, resource allocation, and key milestones. A well-structured implementation plan ensures a smooth transition to the new system.

Setting Up Milestones and Metrics for Measuring the Success of the New HRIS

Establish clear milestones and metrics to track the progress and success of the HRIS implementation. These metrics might include system adoption rates, process efficiency improvements, and user satisfaction levels. Regularly reviewing these metrics helps ensure that the HRIS is delivering the expected benefits and allows for adjustments if needed.

Conclusion

Remember that the needs assessment should be treated as a living document that evolves with your organization. As your business grows and changes, your HRIS requirements may also shift. Regularly revisiting and updating your needs assessment will help ensure that your HR technology continues to meet your organization's needs, remains aligned with business strategies, and adapts to new challenges and opportunities.

By taking the time to conduct a comprehensive HRIS needs assessment, you set the foundation for a successful HRIS implementation that can streamline HR processes, improve employee experiences, and contribute to the overall efficiency and effectiveness of your organization. The effort invested in this initial phase will pay dividends in the form of a more tailored, effective HRIS that supports your organization's goals well into the future.

HRIS (Human Resource Information System) implementation

HRIS (Human Resource Information System) implementation is the process of adopting and integrating a new HR software system within an organization to streamline HR processes and improve efficiency. This involves several key steps, including planning, software selection, data migration, training, testing, and post-launch optimization. Successful implementation leads to centralized employee data management, automated workflows, and better decision-making through data insights.

Key Steps in HRIS Implementation:

1. **1. Planning:**
   Define project goals, scope, budget, and timeline. Identify key stakeholders and form an implementation team.
2. **2. Software Selection:**
   Evaluate different HRIS options based on your organization's needs and choose the best fit. Consider factors like functionality, scalability, and vendor support.
3. **3. Data Migration:**
   Transfer existing employee data from legacy systems to the new HRIS. Ensure data accuracy and integrity during migration.
4. **4. Configuration and Customization:**
   Configure the HRIS to match your organization's specific requirements, including workflows, security settings, and reporting needs.
5. **5. Training:**
   Provide comprehensive training to HR staff and other relevant users on how to use the new system effectively.
6. **6. Testing:**
   Conduct thorough testing of the HRIS to identify and resolve any issues before the official launch.
7. **7. Go-Live:**
   Launch the new HRIS and provide ongoing support to users.
8. **8. Post-Implementation Review:**
   Evaluate the success of the implementation, identify areas for improvement, and optimize the system for better performance.

   Importance of HRIS Implementation:

- **Improved Efficiency:**
  Automates HR tasks, reducing manual effort and freeing up HR professionals for strategic work.
- **Enhanced Data Accuracy:**
  Centralized data management minimizes errors and ensures data consistency.
- **Better Decision-Making:**

Provides access to real-time data and analytics for informed decision-making in areas like talent management and compensation.

- **Streamlined Processes:**
  Simplifies HR workflows, such as onboarding, performance management, and payroll.
- **Cost Savings:**
  Reduces administrative costs associated with manual processes and improves overall HR efficiency.
- **Enhanced Employee Experience:**
  Provides employees with self-service access to information and simplifies HR processes.

Implementing an HRIS System: A Step-by-Step Guide

HRIS Implementation stands for Human Resource Information System Implementation. It is the process of integrating and deploying a digital system that facilitates the management of various HR functions within an organization. HRIS software streamlines processes like employee data management, payroll, recruitment, performance evaluations, and more.

A successful HRIS implementation ensures increased efficiency, accuracy, and accessibility of HR data, leading to better decision-making and improved employee experiences. It matters because an effective HRIS enhances organizational productivity, reduces manual workloads, and enables HR teams to focus on strategic initiatives to attract, retain, and develop talent, ultimately contributing to the company's overall success.

Step 1: Defining Your HRIS Needs and Objectives

The initial stage of any HRIS implementation is comprehending and articulating your specific HRIS needs and objectives. This step is crucial as it forms the cornerstone for the entire process and will play a significant role in ensuring the successful adoption of the system within your organization.

Start by performing an in-depth evaluation of your current HR landscape. Ask yourself the pivotal questions, "What challenges is my HR department currently facing?" and "What objectives am I aiming to accomplish with implementing the HRIS system?" Are you seeking increased efficiency, better compliance management, improved data integrity, or superior employee experience?

You can explore how an HRIS system can offer solutions by identifying the hurdles. Is it a matter of streamlining and automating repetitive tasks, improving the accuracy of payroll and benefits administration, enhancing talent management, or increasing the visibility of workforce analytics?

Moreover, understanding your HRIS goals is equally important. They will guide you toward the appropriate system. Are you looking to transition to a more digital-friendly approach, increase productivity, or promote organizational transparency?

By defining your unique HRIS needs and objectives at the outset, you guarantee that the selected HRIS aligns seamlessly with your organization's strategic goals. This understanding also provides a clear direction for subsequent steps such as system selection, vendor comparison, system implementation, and user training. With this solid foundation, you can successfully implement an HRIS system to transform your HR operations and contribute to your organization's overall success.

Step 2: Selecting the Right HRIS System

Once you have a clear understanding of your organizational needs, the subsequent step in the process is the selection of a suitable Human Resource Information System (HRIS). This is a critical decision that requires a thorough examination of different aspects.

1) Evaluating Vendor's

To begin with, it's essential to evaluate various HRIS vendors in the market. Not all vendors will be the right fit for your organization. Look for reputable vendors known for customer service, support, and reliability.

2) Comparing Features

Next, it is crucial to compare the features of different systems. Consider payroll processing, benefits administration, time and attendance tracking, recruiting modules, performance management, and reporting capabilities.

3) Cost Considerations

The cost is another important factor to consider. It's not just about the upfront cost but also the long-term costs like maintenance, upgrades, and support.

4) Assessing Scalability

Considering the system's scalability is vital for the organization's future growth. A good HRIS system should be able to scale with your business, accommodating an increasing number of employees without a decrease in performance.

5) Integration Compatibility

Lastly, assess how well the HRIS system can integrate with your existing systems. This will facilitate smoother operations and data exchange between different parts of your organization.

6) Involvement of Stakeholders

The process of selection should involve all key stakeholders. This ensures that everyone's needs are considered, and the chosen system will be effective for all departments.
Making the correct decision when selecting an HRIS system can significantly impact your organization's efficiency and effectiveness. Therefore, invest adequate time and resources in this process to ensure the best outcome.

Step 3: Preparing for the Change
Preparing for a significant change, like implementing new HR processes, requires a thoughtful and strategic approach. Change management is the foundation for a successful transition. It involves creating a comprehensive plan that outlines the entire process, including key milestones and goals. Assigning clear roles and responsibilities is crucial to ensure everyone knows their part in the change and can work towards a unified vision.
Resource management is equally vital, as the change may require additional tools, software, or employee training. Ensuring the availability of necessary resources will facilitate a smoother transition. Setting realistic timelines is important to avoid overwhelming employees and to create a sense of urgency without causing undue stress.
A well-thought-out communication strategy is paramount. Transparent and open communication with all employees will help alleviate fears and uncertainties surrounding the change. Regular updates, town hall meetings, and clear channels for feedback are essential to ensure that everyone's concerns are addressed.
Engaging employees and involving them in the change process can foster a sense of ownership and commitment. HR can conduct workshops, training sessions, or focus groups to get valuable insights from the workforce and to make them feel valued.

Step 4: Training Your Team
Once you have chosen the appropriate HRIS (Human Resource Information System) and made all necessary preparations, the next crucial step is to train your team effectively.
It is essential to employ various training methods to ensure a smooth transition to the new system. Hands-on sessions will allow your team members to interact directly with the system, gaining practical experience. Workshops can facilitate group learning, where employees can

ask questions and share insights. Additionally, tutorials, whether written guides or video demonstrations, can serve as valuable self-paced learning resources.
To solidify the acquired knowledge and skills, focus on ensuring retention among your team members. Consider providing ongoing training and support even after the initial implementation. Regular refresher courses or follow-up sessions will help reinforce learning, maintain proficiency, and boost confidence in using the new HRIS.
By adopting a comprehensive training approach and fostering continuous support, your team is more likely to embrace the change positively and optimize the benefits of the new HRIS system. A well-trained and confident team will increase your organization's productivity and efficiency.

Step 5: Going Live and Monitoring
Congratulations on reaching this milestone! Now that your HRIS is ready to go live, the next crucial step is to set up a robust monitoring system to ensure its smooth operation and effectiveness.

Establishing a Monitoring System

Creating a monitoring system involves deploying various tools and processes to monitor the HRIS's performance closely. This system will help you identify potential issues or bottlenecks early on, allowing you to take prompt action and make necessary adjustments.

Proactive Issue Resolution

With a well-implemented monitoring system, you can promptly address any challenges during the live operation. These challenges may include technical glitches, user adoption hurdles, or data integrity problems. Addressing these issues will prevent them from snowballing into more significant problems, ensuring a positive user experience and uninterrupted HR processes.

Measuring Success

Beyond troubleshooting, monitoring will enable you to measure the success of your HRIS implementation. You can track key performance indicators (KPIs) such as process efficiency, employee engagement, and data accuracy to evaluate the system's overall impact on the organization.
Ensuring a smooth HRIS implementation is achievable through a well-structured approach. Start by clearly defining the organization's requirements and objectives, ensuring they align with the selected HRIS system's capabilities. Thorough research and careful selection of the appropriate system are crucial for success. Preparing the organization for change and fostering a positive attitude towards the new system is essential, including addressing potential challenges and resistance.
Adequate training for employees at all levels will help them adapt and make the most of the HRIS functionalities. Lastly, establishing a robust monitoring and evaluation system will enable continuous improvement and optimize HR processes for long-term success. With these steps in place, the HRIS implementation becomes an organized and manageable process, yielding significant benefits for the organization and its workforce.
Benefits and limitations of HRIS
HRIS (Human Resource Information System) offers numerous advantages like increased efficiency, improved data accuracy, and better decision-making, but also presents challenges like high implementation costs and potential security risks.

Advantages of HRIS:

- **Increased Efficiency:**

HRIS automates many routine tasks like payroll, onboarding, and time tracking, freeing up HR staff for more strategic initiatives.

- **Improved Data Accuracy:**

  By centralizing data and automating processes, HRIS minimizes errors and ensures more reliable information for reporting and analysis.

- **Better Decision-Making:**

  HRIS provides access to real-time data and analytics, enabling HR professionals to make informed decisions based on accurate information.

- **Enhanced Employee Experience:**

  Self-service portals within an HRIS allow employees to manage their personal information, request time off, and access important documents, improving their overall experience.

- **Improved Compliance:**

  HRIS can help organizations comply with various labor laws and regulations by tracking employee information and automating compliance-related processes.

- **Cost Savings:**

  While there's an initial investment, HRIS can lead to long-term cost savings by reducing administrative overhead, minimizing errors, and improving efficiency.

- **Centralized Data:**
  HRIS provides a single, centralized location for all employee data, making it easier to access, manage, and report on information.
  Disadvantages of HRIS:

- **High Implementation Costs:**

  Implementing an HRIS can be expensive, especially for smaller businesses, due to software costs, training, and potential hardware upgrades.

- **Potential Security Risks:**

  If not implemented and managed properly, an HRIS can pose security risks, potentially leading to data breaches or unauthorized access to sensitive employee information.

- **Transition Challenges:**

  Switching to a new HRIS can be challenging, requiring significant effort in data migration, employee training, and process adjustments.

- **Reliance on Technology:**

  Organizations become reliant on the HRIS for critical HR functions, and any system downtime or technical issues can disrupt operations.

- **Limited User Adoption:**
  If employees are not properly trained or if the system is not user-friendly, adoption rates may be low, limiting the benefits of the HRIS.

Benefits of HRIS

Following are the benefits

1. Higher speed of retrieval and processing of data.
2. Reduction in duplication of efforts leading to reduced cost.
3. Better analysis and decision making.
4. Higher accuracy of information and reports generated.

5. Fast response to answer queries.

6. Improved quality of reports.

8. Better work culture.

9. Streamlined and systematic procedures.

10. More transparency in the system.

Limitations

Following are the limitations of HRIS.

1. Expensive in terms of finance and manpower requirement.

2. Inconvenient to those who are not comfortable with computers, particularly top bosses.

3. Computers cannot substitute human being, individual decision making and intuition.

4. System needs updating, in many a situation, stale information is as good as no information.

Benefits of HRIS

There are many benefits to using HRIS in your daily job.

Statistics show that HRIS solutions save time and cost for companies while enhancing employee productivity and satisfaction.

Some of the most valuable HRIS software benefits include:

1) Increased Productivity

The automated approach to HR roles can boost productivity in the HR department. According to BambooHR, 72% of HR generalists using self-service HRIS reported a lighter workload.

Furthermore, HRIS can supercharge HR strategies within organizations.

The detailed dataset acquired from HRIS can help HR departments efficiently manage the workforce. It can aid recruitment and onboarding processes, improve financial management through payroll processing tasks, enhance PTO management, and more.

In general, the analysis provided by the HRIS can contribute to more valuable insights leveraged for better decision-making.

2) Centralized Employee Data

With HRIS software, information is stored in a centralized database, which can be easily accessed by all employees. Thus, employees can obtain, edit, and share information whenever needed. This individual yet unified approach of HRIS helps reduce redundancy and make the jobs of HR professionals easier.

Employees can conduct simple administrative tasks by themselves, so HR professionals can save precious time for more essential aspects of their work. For instance, employee self-

service HRIS can reduce the time for administrative tasks by 40-60%, giving two hours of extra time per day to HR professionals.

3) Automation of HR Roles

45% of companies are in the early stages of basic automation, while automation is on the rise, with 74% of companies actively looking for new use cases for automation. It's no surprise knowing the possibilities it creates for HR departments and employees.

This HRIS software benefit reduces much of the manual work, paperwork, and bureaucratic tasks. This time-effective HRIS benefit allows HR professionals to dedicate more time to the human aspect of their work and high-level tasks such as recruiting and onboarding new employees, increasing team productivity, enhancing organizational culture, and much more.

4) Improved Data Storage & Data Security

The benefits of HRIS in an organization are easily visible through easy access to data. The centralized nature of HRIS means the information is available to anyone in the organization at any time. Therefore, it can be accessed, shared, or updated faster.

Moreover, essential and valuable data can be encrypted and backed up, providing data security at the highest level.

5) Higher Report Accuracy & Improved Oversight

Aside from the office automation function of HRIS, it is broadly used to quickly create reports and presentations. Since all the data is centralized, HR staff can efficiently run detailed reports such as salary, benefits, and proposed increase reports.

In addition, HRIS software can monitor and manage organizational tasks and routines and notify HR administrators whenever specific terms are not met.

Plus, the greater picture obtained by HRIS software can pinpoint individual issues that can be further solved by the HR department. Lastly, the benefit of HRIS can extensively reduce human errors during administrative tasks.

6) Enhanced Recruitment

HRIS can streamline the process of recruitment in numerous ways.

With the help of HRIS, HR professionals can accept online applications faster and sort them by relevant filters regarding the position.

For example, by using different filters, HR professionals can browse applications by location, levels of education, professional experience, and more. Moreover, HRIS can also enable internal recruitment, allowing current employees to apply for open positions within the company.
One of the biggest challenges to corporate sustainability is the "green premium," which is the extra cost associated with choosing more sustainable products and services.

Deloitte's Global Sustainability Survey offers a glimpse into changing attitudes and behaviors across the globe.

Support for climate action appears to be weakening this year, and fewer individuals are making sustainable choices. Unsurprisingly, some may be tempted to cut back on sustainability efforts to save money.

However, businesses can still make a compelling case for sustainable practices to skeptical decision-makers.

Here's the kicker: sustainability is not just good for the environment, but also for business.

Research from the Harvard Business Review reveals that sustainable businesses enjoy greater financial gains than their unsustainable counterparts. In fact, an impressive 69% of companies report that their financial gains from climate initiatives have exceeded their initial expectations.

7) Easier Onboarding

HRIS can improve the process of onboarding, thus contributing to more satisfied and motivated employees. Statistics show that when HR departments use HRIS for onboarding, it leads to five times higher employee engagement.

Not only does HRIS alleviate the onboarding process, but it also improves the retention rate. By using HRIS effectively for onboarding, companies reduce turnover rates by 30%.

The self-service nature of HRIS can allow employees to individually access admin, become familiar with the work environment and the role, start training, and develop a sense of belonging within the company or organization.

Challenges of HRIS

With the many advantages of HRIS come some limitations as well, which include:

- Cost to purchase and implement HRIS software.
- HR department and employee training.
- Adaptation time for all HRIS users.
- Hiring an IT specialist to manage the system.
- Hiring an HRIS analyst to maintain and update the system and more.

Still, the pros of obtaining HRIS software for your company outweigh the cons.

It can empower the HR department without posing a threat to HR job positions because of the important human aspect of HR.
To sum it up, the benefits of HRIS within an organization are extensive.

They can stretch from streamlining administrative and bureaucratic tasks to boosting motivation and productivity. Its time and cost-effective benefits make the investment worth it for both HR departments and companies.

Information security and Human Resources Information Systems (HRIS)

Information security and Human Resources Information Systems (HRIS) are closely linked due to the sensitive nature of employee data stored within HRIS platforms. HRIS systems

manage a wide range of confidential information, including social security numbers, bank details, and performance evaluations, making robust security measures essential to protect employee privacy and organizational data.

Key Aspects of Information Security in HRIS:

- **Data Protection:**

  HRIS systems must implement strong security measures to safeguard sensitive employee data from unauthorized access, breaches, and misuse.

- **Compliance:**

  HRIS systems play a crucial role in helping organizations comply with data privacy regulations, such as GDPR and CCPA, which mandate the protection of personal data.

- **Access Control:**

  Implementing role-based access control (RBAC) is vital to ensure that only authorized individuals can access specific data and functionalities within the HRIS.

- **Data Encryption:**

  Encryption techniques are used to convert sensitive information into an unreadable format, protecting it even if intercepted.

- **Regular Security Audits:**

  Organizations should conduct regular security audits to identify vulnerabilities and ensure the HRIS system remains secure against evolving threats.

- **Monitoring and Alerts:**

  Proactive monitoring and alerting mechanisms can detect and respond to suspicious activity within the HRIS, minimizing the risk of security breaches.

- **Vendor Security:**

  When selecting an HRIS vendor, organizations should assess their security practices, including data encryption, access control, and compliance certifications.

- **Integration Security:**

  HRIS systems often integrate with other business systems (e.g., ERP, CRM). Organizations must ensure secure integration to prevent data leakage across platforms.

- **Employee Awareness:**
  Educating employees about data security best practices within the HRIS is crucial to minimize the risk of human error and accidental data exposure.
  Benefits of Robust HRIS Security:

- **Reduced Risk of Data Breaches:**

  Strong security measures help prevent costly data breaches and associated legal repercussions.

- **Enhanced Employee Trust:**

  Demonstrating a commitment to data security builds trust and confidence among employees.

- **Improved Compliance:**

  Robust security practices help organizations meet legal obligations and avoid penalties for non-compliance.

- **Streamlined HR Processes:**
  Secure and efficient HRIS systems can streamline HR processes, improve data accuracy, and reduce administrative burden.
  Future of HRIS

The future of HRIS (Human Resources Information System) is one of increasing integration with advanced technologies like AI and machine learning, along with a greater emphasis on employee experience and strategic HR management. HRIS systems will evolve to be more intuitive, data-driven, and integrated with other business systems, ultimately empowering HR professionals to be more strategic partners in driving organizational success.

Here's a more detailed look at the key trends shaping the future of HRIS:

1. AI and Machine Learning:

- **Automation of tasks:**

  AI and ML will automate many routine HR tasks, such as resume screening, interview scheduling, and on boarding, freeing up HR professionals for more strategic work.

- **Predictive analytics:**

  HRIS will leverage AI to analyze data and predict future trends, such as employee turnover, skills gaps, and hiring needs, enabling proactive workforce planning.

- **Personalized employee experiences:**
  AI can personalize learning and development paths, compensation planning, and career development opportunities based on individual employee needs and preferences.
  2. Employee Self-Service and Mobile Access:

- **Enhanced employee portals:**

  HRIS platforms will continue to expand self-service capabilities, allowing employees to easily manage their personal information, benefits, and time off requests.

- **Mobile-first approach:**
  HRIS will be designed with a mobile-first approach, enabling employees to access information and complete tasks on their mobile devices, regardless of location.
  3. Data-Driven Decision Making:

- **Advanced reporting and analytics:**

  HRIS will offer more robust reporting and analytics capabilities, providing HR professionals with deeper insights into workforce trends and performance.

- **Integration with other business systems:**
  HRIS will integrate with other business systems, such as ERP and CRM platforms, to create a more holistic view of the organization and its data.
  4. Focus on Employee Wellbeing:

- **Integration with well-being programs:**

  HRIS tools will integrate with well-being programs to measure employee satisfaction and offer support services.

- **Creating a healthy work environment:**
  By 2025, creating a healthy work environment will be a critical factor in attracting and retaining top talent, and HRIS will play a key role in supporting these efforts.
  5. Cloud-Based and Scalable Solutions:

- **Software as a Service (SaaS):**

  Cloud-based HRIS solutions will become even more dominant, offering greater flexibility, scalability, and accessibility for organizations of all sizes.

- **API integration:**
  HRIS platforms will offer open APIs to facilitate integration with other business systems and third-party applications.
  6. Increased Emphasis on Compliance:

- **Automated compliance:** HRIS will play a crucial role in ensuring compliance with ever-changing regulations, with automated tools for tracking and managing compliance-related tasks.

7. Strategic HR Management:

- **Talent acquisition and management:**

  HRIS will be increasingly used to streamline the talent acquisition process, manage employee performance, and develop future leaders.

- **Workforce planning:**

  HRIS will help organizations anticipate future workforce needs and plan for talent acquisition, training, and development.

  In conclusion, the future of HRIS is bright, with advancements in AI, machine learning, and cloud computing driving significant changes in how organizations manage their workforce. By embracing these trends, HR professionals can become more strategic partners in driving organizational success and creating a more engaged and productive workforce.