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HUMAN RESOURCE ASSESSMENT USING AN AFFORDABLE SOFTWARE TOOL

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Abstract: This paper identifies and develops a software tool for the assessment of human resources in an organization when the labor market is facing a staffing crisis. The research methodology is based on a comparative analysis of two software tools: Access and Excel, so that the least expensive and highly accessible solution is chosen. The paper will present the steps to create a database that will represent the starting point for creating a human resources evaluation matrix. Through this matrix, information can be obtained on the distribution of human resources according to gender, department and performance level. The annual staff evaluation matrix groups the organization's employees into four categories: Below ambition, Accomplished, Exceptional, Outstanding.

Key words: Assessment, database, software tool, human resources, matrix, organization.

1. INTRODUCTION

“In today’s enterprises, it is seen that the traditional methods used for the management of business processes are no longer sufficient. Business processes that are complicated in enterprises have become manageable only by using technology. Rapid developments in the internet technology have also diversified the understanding and operation of human resources management” [4].

“As employees prioritize their necessities over everything, HR responsibilities will evolve to deliver the best employee experience. Digital acceleration will rule even amidst geopolitical tensions and acute inflation in 2023, and human resources are no exception. Companies embracing HR digital transformation are poised to battle with the sudden change in work culture and improve HR capabilities” [7].

Human resources are one of the most expensive and vulnerable resources. Human resources have expectations from a financial as well as a social point of view, wanting to benefit from as many advantages as possible.

To have adequate human resources, organizations are in a continuous process of training and evaluation, which requires a long-term financial effort. Organizations strive to

motivate their employees and retain them for the long term. In this context, they look for solutions for recruiting, motivating, and evaluating human resources.

“HR leaders see building critical skills as vital to driving many of their organization’s priorities — from growing the business and executing business transformation to improving operational excellence. Traditional ways of predicting needs and upskilling the workforce aren’t working in today’s highly changeable conditions, where employees need more skills for every job and many of those skills are new” [1]. In the current context, where more and more emphasis is placed within companies on self-organization and the development of multifunctional teams, every team that wants to develop must have as many skills as possible to face everyday challenges. But if there are teams that are currently involved in the same process or in the case of newly formed teams, it is difficult to determine if they possess the desired skills in the necessary proportions [8].

Several tools are used in the evaluation and management of human resources, such as [8]:

- Matrix of Competences, to know who is prepared to occupy a certain position or in which field should be invested to develop the staff. This is a complex and extremely effective method.

- The Skills Matrix, a useful tool for evaluating the set of professional skills possessed by the entire team.

- Position Evaluation Matrix, a tool used to assess performance and competencies for a specific position in the organization. For the use of this matrix, specific criteria are defined and scores or ratings are given for each criterion, depending on the performance required for the job.

The objective of the research is to identify and develop a software tool for the evaluation of the human resources in an organization, given that the labor market is facing a personnel crisis.

The paper proposes a human resources evaluation tool made in Excel, because it is financially accessible, as well as from the point of view of the level of skills that the software maker and the application user should possess.

Some companies use in their internal analysis different tools made in Excel, because they can be adapted very easily, using internal human resources, to meet the requirements of the company's management.

The existing tools on the market are more rigid in options and the needs and requirements of companies can change often, so they need a cheap and fast internal solution to adapt the tool.

The paper will present the steps to create a database for the creation of a human resource evaluation matrix. Using the database, an annual staff evaluation matrix will be created for the organization to identify the degree of involvement of each employee.

The data used in this research is fictitious, and the creation of the staff evaluation matrix meets the needs of the human resources department in a real organization.

2. RESEARCH METHODOLOGY

The research methodology used to achieve the objective of the paper is based on a comparative analysis of two digital tools: Access and Excel. To identify the best solution for the evaluation of the human resource, accessible digital tools were compared, both from a financial point of view and from the point of view of the degree of use (Table 1).

Both Excel and Access allow you to create PivotTable reports and PivotTable charts.

However, Excel offers more advanced features for reports and PivotTable charts than Access. When creating extensive PivotTable reports or providing professional graphics, it is recommended to use Excel's PivotTable charting and reporting capabilities instead of Access's [2]. In Excel, you can specify user-based permissions to access data or set read-only rights that prevent other users from changing the data they have access to. Access does not provide user-level security features, but Access supports the user security model of any database server it connects to [5]. The IFS function is used in Excel to test multiple conditions at once and return a result based on them. The IFS function can accept up to 127 conditions and their associated values. For each condition, a value is specified to be returned if the condition is true [6].

Table 1.

Comparative analysis of two digital instruments.

| Digital Instrument | Purpose of use |
|--------------------|---|
| Access | <ul style="list-style-type: none"> • Since there will likely be a lot of activity in the database, robust alternatives are needed to handle data updates properly. • Adding additional tables to a dataset that first appeared to be flat or non-relational. • Advanced queries are run. • Various reports are generated. |
| Excel | <ul style="list-style-type: none"> • When the data is primarily numerical, a flat or non-relational view of the data is required rather than a relational database that makes use of many tables. • On the data, statistical comparisons and calculations are commonly made. • To see hierarchical data in a condensed and adaptable structure, PivotTable reports are used. • Regular charting is planned and makes advantage of the new Excel chart forms. • Conditional formatting icons, data bars, and colour scales are used to highlight data. • The data is subjected to sophisticated what-if analysis processes, including statistical, engineering, and regression analysis. • Maintain a simple list of items for personal use or a little amount of collaborative work. |

Excel has many functions that can meet the needs of an organization, such as: accounting, budgeting, invoicing and sales, reporting, planning, monitoring, etc. [3]. Following the comparative analysis of the two digital tools, Access, and Excel, it turned out to be the easiest to implement for an organization is Microsoft Excel, both from a financial and accessibility point of view.

3. DATABASE FORMATION

In Excel, a database is a collection of related information that is organized in a tabular format. Each column represents a category of information, and each row represents a specific record. After organizing the data into tables, Excel's built-in functions can be used to sort and filter the data. In addition to these features, Excel also supports the creation of pivot tables and charts, which allow for quick analysis and summarization of large amounts of data.

To develop an application for human resource management in Excel the following steps are taken:

- Planning and analysis, which consists of identifying the requirements and specifications for the database, understanding the needs of the HR department and the data they want to manage, establishing the structure and columns necessary to ensure the efficient storage and management of employee information;
- Creating a new spreadsheet in Excel to start creating the database, this will be the space where employee data will be entered and organized;
- Definition of columns (fields), data types and titles, in the first line of the spreadsheet, for each column in the database (e.g., "Identification code", "Name", "First name", etc.), these titles will provide a clear reference for the data entered in each column.
- Entering employee data will be done in each appropriate column.
- Data formatting and validation ensure that information is entered correctly and is properly validated, special formats can be

applied to date columns (e.g., "Date of Birth") and restrictions can be set on the data entered (e.g., columns with identification code).

- Creation of forms and reports, which facilitate the entry and management of data, as well as the creation of reports and pivot tables to analyze and synthesize data from the database.
- Ensuring data security, as data is sensitive, to protect confidential information. Spreadsheet-level protections can be applied to restrict unauthorized access.
- Testing and reviewing ensure that the database is working correctly, and that all data input is handled properly, adjustments and changes will be made if necessary.
- Detailed documentation of the database and specific functionality to enable users to understand how to use and manage the database.
- Implementing the database for use in the human resources department and providing adequate training to users to ensure correct and efficient use of the database.
- Ensuring the continuous maintenance and updating of the database to remain relevant and functional over time.

These steps help to develop applications in Excel, to effectively create and manage a database to manage the human resource, defining specific criteria.

4. HUMAN RESOURCES ASSESSMENT MATRIX

With the help of the database, various applications can be created that serve the human resource management within the organization, such as an annual staff evaluation matrix.

4.1 Creation of the matrix for the evaluation of the human resources

An annual staff evaluation matrix made in Microsoft Excel is a structured and organized tool for evaluating the performance of employees in an organization. Through this matrix, the potential classification of the employees' performance is realized, based on

which they can obtain the following qualifications:

- Below Ambition: The employee does not fully meet the goals, tasks, and responsibilities of the role and/or does not act in accordance with the behaviors and values of the organization. Thus, the performance is not satisfactory and needs improvement;
- Accomplished: The employee fully meets the various objectives, tasks and responsibilities of the role delivers high quality in a reliable and consistent manner acts in accordance with the behaviors and values of the organization. Actively collaborates with stakeholders and colleagues. Thus, it generates added value to the company;
- Exceptional: Additionally, the employee achieves results beyond expectations demonstrates a proactive approach with a strong influence on the company's success, is recognized as a role model by stakeholders and peers. Thus, it successfully manages particularly difficult situations;
- Outstanding: Additionally, the employee achieves extraordinary results beyond expectations. Thus, it establishes new performance standards/references and contributes to the overall success of the company;

For the application of the annual personnel evaluation matrix, the human resource evaluation manager establishes specific evaluation criteria for each department. An example of criteria for evaluating employees in a department would be:

- Degree of fulfilment of objectives, tasks, and responsibilities;
- Compliance with the norms and values of the organization.

Each criterion is given a score from 1 to 10. Depending on these criteria and the score obtained by each employee, at the end of the evaluation period, he will be placed in a certain category from the four: Below ambition, Accomplished, Exceptional, Outstanding.

To make such an annual staff evaluation matrix, in addition to the visual and constructive aspect, certain formulas are also needed to help

interpret the matrix and analyse the results of the staff evaluation. The formulas used are those of the type below.

In the *orange* quadrant, in Table 2, the "COUNTA" function is used, it is used to count the number of cells containing values (text, numbers, data, formulas, etc.) in a certain range of cells. This function excludes empty cells and cells containing errors.

In the *green* quadrant, from Table 2, divide the number of employees in the orange cell by the total number of employees; the result is expressed as a percentage.

In the *blue* quadrant, in Table 2, the "VLOOKUP" function is used, with the help of which the gender of the employee is searched, depending on the full name.

In the *grey* quadrant, in Table 3, the "SUM" function is used, which adds all the numerical values in a specified range and returns the resulting sum. Add up all the results like those in the orange quadrant, mentioned above.

The *yellow* dials use the COUNTIF function, which is used to count the number of cells in a range that meet some specified condition.

This function was used, in the first case, to find the number of men, and in the second case, the number of women, employees who were involved in the annual evaluation, with the help of searching for the gender of the staff in sections such as the blue quadrant, mentioned above, in Table 2.

After the cells have been populated with all the employees who are subject to the annual personnel evaluation, the matrix will contain information of the type shown in Figure 1.

Table 2.

| First analysed section. | |
|-------------------------|-----------------|
| 4 | 13% |
| M | Gavril Ivanov |
| M | Lucian Lascu |
| M | Ioan Aldo Lunca |
| F | Violeta Popa |

Table 3.

| Second analysed section. | |
|--------------------------|----|
| Total employees | 30 |
| Male | 22 |
| Female | 8 |

| ANNUAL HUMAN RESOURCE ASSESSMENT | | | | | |
|---|-------------------------|-------------------------------|--------------------------|-------------------|--------|
| 01.mar.23 | | | | | |
| Department: Production | | | | | |
| | Potential Rating | Performance Distribution | | | |
| | | Corporate Target Distribution | 2023 Actual Distribution | 2022 Distribution | |
| 1. Outstanding (Exceeds expectations) | 4 | 13% | | | |
| | M Gavril Ivanov | | | | |
| | M Lucian Lascu | | | | |
| | M Ioan Aldo Lunca | 15% | 13% | 10% | |
| | F Violeta Popa | | | | |
| 2. Exceptional (Sometimes exceeds expectations) | 8 | 27% | | | |
| | M George Macovei | | | | |
| | M Costel Manea | | | | |
| | M Calin Mariut | | | | |
| | M Emanuel Costin | 30% | 27% | 36% | |
| | M Valer Duma | | | | |
| | M Eugen Cimpan | | | | |
| | M Corneliu Coatu | | | | |
| | F Viorica Muresan | | | | |
| 3. Accomplished (Meets expectations) | 16 | 53% | | | |
| | M Valenu Cristescu | | | | |
| | F Sabata Danulescu | | | | |
| | M Alexandru Danie | | | | |
| | F Vasile Elena David | | | | |
| | M Ionel Deliu | | | | |
| | M Aurel Dobref | | | | |
| | M Liviu Mihai | | | | |
| | M Gabriel Oltu | | | | |
| | F Andreea Pacurar | 55% | 53% | 54% | |
| | M Florian Parfene | | | | |
| | F Liliana Cernat | | | | |
| | F Alimpiu Giurgiu | | | | |
| | M Dragoș Morega | | | | |
| | M Petre Mosoiu | | | | |
| | F Nicoleta Nicolescu | | | | |
| | M Florin Ofrim | | | | |
| 4. Below Ambition (Expected more) | 2 | 7% | | | |
| | M Sorin Tudorel Chiuta | | | | |
| | M Mihai Razvan Munteanu | 0% | 7% | 0% | |
| Total employees | | 30 | | | % |
| Male | | 22 | | | 73,33% |
| Female | | 8 | | | 26,67% |

Fig. 1. Annual staff evaluation matrix, completed.

4.2. Application of the personnel evaluation matrix

The Personnel Distribution Matrix is being used in a multinational automotive company. With the help of this matrix, the difference between “Corporate Target Distribution”, “Actual Distribution 2023” and “2022 Distribution” can be seen. The distribution by gender in the studied department can also be observed. All these studies are created to make appropriate decisions to improve various results in the company. To apply the matrix, the HR representative organizes a meeting involving all the team and group leaders of a department. They need to review the performances of the past year of their employees. They may also prepare a short presentation to highlight all the achievements that their employees have made. If not, the team or group leaders describe their employee as best as they can, and wait for the approval of the other leaders, to decide upon an appropriate rating for the employee they represent. After a decision has been made, the employee is given a rating that can increase or

decrease it’s ranking in the next year. The new distribution of the employees is centralized in the Personnel Distribution Matrix by the HR representative.

To better explain the different ratings of the Personnel Distribution Matrix there are different scenarios prepared; for example, the "Under Ambition" potential is never desired. It indicates low performance at work. Also, the result of the “Achieved” potential is observed to be in the highest percentage, because most employees aim to fulfil their mandatory tasks, and do not show an interest in making additional effort in the company. “Exceptional” and “Excellent” potentials are of course the most desired in a company. They show the dedication and effort of our most dedicated employees.

Following the application of the matrix to 30 employees and following the discussion of the employees' performances by their superiors, the following conclusions can be drawn:

- The “Outstanding” classification was achieved by 4 people. Although the actual percentage of 13% is lower than the ideal 15%, it is better than last year's 10%. The classification “Exceptional” has a lower distribution now 27% than in the previous year 36%, but it is closer to the ideal 30%.
- The “Accomplished” classification is populated with the largest number of employees, and the most consistent between “actual”, “ideal” and “past”.
- The classification “Below ambition” has an undesirable percentage of employees, and their superiors will have to take measures regarding them.

5. CONCLUSION

Database applications for human resource management provide several functionalities that facilitate the work of human resource management within the organization. One such application is the annual staff evaluation matrix. The annual staff evaluation matrix is a structured method of evaluating employee performance. This is done electronically using Microsoft Excel software. The matrix contains formulas and functions that help interpret and analyse the

evaluation results. Through this matrix, information can be obtained on the distribution of staff by gender, department, and performance level. These data are useful in making decisions, improving the performance and structure of the human resource in the departments as well as the results of the organization.

After the realization of the staff evaluation matrix, it was found that this is not an expensive one and is particularly useful in the activity of the human resources department within an organization. To create the database, several steps are followed, and various functions are used. As for the costs of making such a database, the estimate is based on the gross monthly salary of the employees involved in the development of the database. Thus, the estimated costs of creating a simple database can vary between EUR 262 ÷ 530, depending on the salary of the employees involved, as well as the number of hours allocated for its development.

These database-driven applications facilitate the process of personnel management and help in decision-making in terms of evaluating, developing, and improving the performance of employees within the organization.

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Utilizarea instrumentelor digitale în evaluarea resursei umane

Această lucrare identifică și dezvoltă un instrument software pentru evaluarea resursei umane dintr-o organizație, în condițiile în care piața forței de muncă se confruntă cu o criză de personal. Metodologia de cercetare se bazează pe o analiză comparativă a două instrumente soft: Access și Excel, astfel încât să fie aleasă soluția cea mai puțin costisitoare și cu grad de accesibilitate ridicat. În lucrare se vor prezenta pașii realizării unei baze de date care va reprezenta punctul de pornire pentru realizarea unei matrici de evaluare a resursei umane. Prin intermediul acestei matrici, se pot obține informații despre distribuția resursei umane în funcție de sex, departament și nivel de performanță. Matricea de evaluare anuală a personalului grupează angajații organizației în patru categorii: Below ambition, Accomplished, Exceptional, Outstanding.

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