# Application of Web-Based Certainty Factor Method To Developo An Employee Job Stress Diagnosis System To Improve Employee Performance

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**Abstract**

This research aims to find out how to build an expert system for diagnosing work stress in employees using the certainty factor method. The data obtained was obtained in the following ways: Literature study, interviews, and questionnaires The population in this research is all employees. The sample for this research was 100 employees. The system development method used consists of requirements plan, system design, and implementation. Based on the research results, it was found that the expert system for diagnosing employee work stress uses the certainty factor method, which is easy for users to understand in presenting questions and results by employees, and the system can process data on symptoms, causes, and solutions because employees only select symptoms and do not enter them. symptom values that make users less understanding. This expert system has consistent answers. If you try to select the same symptoms, the results will be the same and in accordance with the expert's results.

**Keywords:** Expert System, Work Stress, Employees, Certainty Factor.

## 1. Introduction

Employees are human resources that are very important for the company because they have the intelligence, thoughts, talents, creativity, and energy needed to do all the work assigned by the company to achieve the company's goals [1][2]. The better the individual performance in a company, the higher the company's performance, and vice versa, the lower the individual employee's performance, the lower the company's performance [3]. One aspect of enhancing employee performance is addressing work-related stress. Prior studies have indicated that work-related stress has an impact on workers' productivity [4]. Job stress is an individual's inability to fulfill job demands, so that individual employees feel uncomfortable and uneasy [5]. At work, employees sometimes experience work stress, such as feeling worried about being inadequate, uncomfortable, bored, afraid or tense, sad, and depressed. Work stress can appear at any time among workers, especially among those with a heavy and monotonous workload [6]. With the development of science and technology nowadays, computers are nothing new for their users [7]. The use of computers is not only limited to processing data but is also used as a provider of solutions to given problems, such as solving difficult problems, one example of which is diagnosing work stress in employees [8]. Limited health information services, a lack of psychologists who can provide information about work stress, and high doctor fees result in a lack of employee knowledge about their psychology [9].

Efforts are made so that every employee who suffers from work stress can easily and quickly find out about the disease and its symptoms, so that they can be given a solution by the company [10]. An expert may diagnose work stress in employees with the aid of this expert system, a type of artificial intelligence (AI) [11]. An expert system is a computer software that solves issues by applying expert knowledge [12]. An expert is a person with specialized knowledge and abilities who can solve difficulties that laypeople are unable to solve [13]. Expert systems have a wide range of uses and advantages, including boosting output and productivity since they can work more quickly, function in a variety of settings at any time, and never get sick or bored [14]. There are various techniques that can be applied while developing an expert system to facilitate the solution of current issues. The certainty factor method was applied by the author on this occasion [15]. Expert confidence can be measured using the certainty factor technique [16]. Expert systems can make use of this technique to determine if a diagnosis of an illness is certain or doubtful [17]. Calculations using this method can maintain the accuracy of the data [18].

According to previous research, which states that the implementation of the certainty factor in an expert system for diagnosing and treating mental disorders, it can be concluded that the accuracy of applying the certainty factor method in an expert system for treating mental disorders is 90% [19]. In other research, an expert system for detecting DSLR camera damage using the CF (certainty factor) method was able to complete the system and the

process of making a diagnosis based on the symptoms experienced by the user [20]. However, the application that the journal's researchers created at this time only includes identification of DSLR camera damage; it does not yet have a tutorial on how to repair DSLR cameras [21]. Then the application is still too complicated for novice users when the user has to enter an estimated CF value if the symptoms felt are absolute [22]. Create an expert system application to identify formaldehyde content in food using the certainty factor method [23]. The author has also succeeded in creating an application that can add characteristics and categories of foods that contain formaldehyde, and the application has no errors or can be run; however, in making the application, the author still uses Visual Basic in the system and lacks knowledge about the side effects of formalin foods or pictures so that the application looks better, and the results of the diagnosis have no trust value [24]. Calculating employee work stress using manual calculations and not using the certainty factor method to diagnose work stress in employees [25]. Then the author did not create an expert system for analyzing employee work stress [26].

An expert system is a computer program or system that incorporates the knowledge of an expert in a particular field into its performance. Non-expert users can use this program or system to make decisions or establish policies, just like experts do [27] [28]. Stress is a bodily and psychological reaction to environmental demands on a person [29]. The body's reaction to stress includes cold sweats, shortness of breath, and heart palpitations [30]. Psychological reactions to stress include frustration, tension, anger, and aggression. In stressful situations, there are a number of feelings, such as frustration, tension, anger, hostility, or aggression [31]. In other words, the situation is under pressure. Job stress is an increasingly critical problem for workers, employers, and society [32]. Stress in the workplace is a growing concern in today's economic climate, where employees encounter conditions of overwork, job discomfort, low levels of job satisfaction, and a lack of autonomy [33]. Workplace stress has been shown to have detrimental effects on employee health and well-being, as well as negatively impacting workplace productivity and profitability [34]. Measures that individuals and organizations can take to reduce the negative effects of stress or stop it from occurring in the first place. Employees first need to learn to recognize the signs that indicate feelings of stress, and employers need to realize that stress can affect employee health, which in turn affects the company's bottom line.

## 2. Research Methods

The data obtained was obtained in the following ways: a literature study, interviews, and questionnaires. At this stage, a literature study or literature review is carried out by studying books in the form of printed media related to research such as expert system programming, information system architecture, nursing psychology, and so on. At this point, the source and the interviewer are having a conversation as part of the interview. The purpose of the interview is to get the right information from a trusted source. Currently, a list of questions is distributed to respondents as part of the questionnaire in the hopes that they will answer the questions, therefore data is being gathered. All employees received surveys from the author. All of the participants in this study were workers. One hundred employees served as the research sample. The requirements plan is the initial step in the system development process. In this stage, authors and users meet to talk about the goals of the application or system and the information that it will require, particularly information on the symptoms of work-related stress in employees. System design comes in second. The second stage involves building the system's database and writing the code to use the data that has been collected and represented in the information system architecture. The Unified Modeling Language (UML) is typically utilized by the system modeling tools. Use case, activity, sequence, and class diagrams are all used by the author. Finally, Implementation. At this stage, the researcher conducts coding, implements the programming language, namely PHP, and creates a database in the form of MySQL. At the end of this stage, the author also asks for user responses to the applications that have been tested so that they can be evaluated for further system development.

## 3. Results and Discussion

This expert system for diagnosing employee work stress using the web-based certainty factor method is a system that includes knowledge from an expert. In this system, employees are asked to choose from each symptom they are experiencing, and then the results will be issued in the form of a diagnosis, belief value, and solution. The diagnostic output results can be printed in the form of a PDF document. At this stage, a problem needs analysis to be carried out to create a system that provides solutions to the problems faced. In this planning phase, the author conducted research to collect data and information as a basis for creating the system. Then, for a diagnosis and solution, the author conducted an interview with a psychologist. Previously, the author collected diagnostic information data from questionnaires using Haphazard or convenience sampling. This is a very simple sampling method, namely by taking observation units that are found or that are possible. At this stage, a problem needs analysis to be carried out to create a system that provides solutions to the problems faced. In this planning phase, the author conducted research to collect data and information as a basis for creating the system. For data or information on system requirements, the author used the bibliography method by taking data on symptoms of work stress, and for diagnosis and solutions, the author conducted an interview with a psychologist.

The second stage of the planning phase is explaining the purpose of establishing the system. Based on the previous needs analysis and problem definition, the author intends to apply the CF method to diagnose employee work stress according to the diagnoses, symptoms, and relationships inputted by the user. This system will be applied to the website application platform, considering the increasing intensity of people using various websites. Meanwhile, the author uses the certainty factor method in applying expert system theory because the certainty factor can implement an expert system that is able to process uncertainty from various facts and symptoms in diagnosing employee work stress. A web server is an absolute requirement for a web-based system. A web server is a platform for running a web-based system. To develop this system, the Web server Apache 2.4.25 is needed. A programming language is needed to be able to build a system so that the computer can carry out various operations and functions according to the user's wishes. For this reason, a programming language is needed that can be used to create a client-server system. The programming language needed to develop this system is PHP 4.6.5.2. Database management will be used to complement programs such as the login process as well as the ordering process and product file storage. The database required is the MySQL 10.1.21 MariaDB database.

Diagnosis of work stress, namely identification based on symptoms. Computer programs made to facilitate better decision-making can assist with assessment through counseling. Symptoms of job stress, namely indications of the existence of work stress or undesirable health problems, are in the form of signs or characteristics of work stress and can be felt, such as feelings of anxiety and boredom towards work. The relationship between diagnoses and symptoms, namely the combination of work stress diagnoses and symptoms, ensures a calculation of the certainty of the type of diagnosis based on psychologists or experts. Certainty factor (CF) calculation is an evaluation method that is very useful in the world of medicine and psychology to assess and measure the level of confidence of doctors or health professionals regarding a diagnosis, especially related to work stress in employees. CF utilizes two important aspects: the measure of belief (MB) and the measure of disbelief (MD). MB reflects the extent to which physicians increase their confidence in a diagnosis of work stress based on observed symptoms, while MD reflects the degree to which they increase their distrust of the same diagnosis. Through this analysis of increases in confidence and distrust, CF is then calculated to interpret how strong or weak the relationship is between the proposed hypothesis and the observed symptoms. The CF value ranges from -1 to 1. If the CF is close to 1, it indicates a high level of confidence in the diagnosis. Conversely, if the CF value is close to -1, this indicates strong distrust of the proposed diagnosis. However, it is important to remember that although CF provides an indication of trust or distrust, it can also be influenced by variations in clinician interpretation and knowledge, as well as other factors that may not be fully measurable objectively. Nonetheless, the use of CF provides a useful framework for helping to estimate how convincing an employee's job stress diagnosis will be based on observed symptoms, taking into account the clinician's increased confidence and distrust of the proposed hypothesis.

In the system that the author designed, there are running processes that are expressed in a use case. This system is designed to serve two main user groups, namely employees and administrators or experts, by offering functionality that suits each user's needs. The use case for employees includes a series of features that allow them to evaluate the level of work stress they experience. They can access information related to stress management, resources that help reduce stress in the work environment, and potentially fill out questionnaires or carry out evaluations regarding their psychological condition. This allows employees to proactively understand and manage stress in their work, improve their own well-being, and achieve better performance. Meanwhile, use cases for administrators or experts feature access to features that allow them to manage the administrative aspects of the system and provide professional assistance. They can manage employee data, analyze the results of questionnaires or job stress evaluations that have been filled out by employees, provide recommendations or interventions based on in-depth analysis of existing data, and make adjustments or configurations to the system to align with the latest developments in research or related best practices. work stress. With an approach that focuses on both types of users, this system provides a comprehensive understanding of the features provided for employees and administrators, or experts. The main objective is to facilitate the implementation of relevant and appropriate solutions for managing work stress in the work environment by providing the necessary tools for employees to manage stress as well as providing support for administrators or experts to carry out appropriate interventions based on in-depth analysis of existing data.

The admin activity diagram series depicts in detail the steps taken by an admin when interacting with an existing system. Each activity diagram shows the key processes that administrators involve in carrying out their duties. The login activity diagram first outlines the steps that the admin must take to log in before accessing the system. This process begins by entering the username and password registered in the system database, ensuring authorized access to the platform. After successful login, the logout activity diagram provides steps to log out of the system safely. This gives administrators the option to exit their access session by ending the connection to the system. He continued; the diagnostic activity diagram provides guidance on how administrators can manage work stress diagnosis data. Features such as adding, editing, searching, and deleting diagnoses already stored in the system database are covered here. Meanwhile, the symptom activity diagram provides similar instructions for managing symptom data related to employee work stress. This series of activity diagrams provides a comprehensive overview

of how administrators use the system, facilitating more efficient management of diagnostic data and symptoms related to work stress. With a well-structured process, the system supports administrators in carrying out their administrative and managerial tasks effectively, providing convenience in managing the necessary data according to existing needs.

The admin activity diagram continues to cover a series of processes that cover the various features that the admin can access in the system. The delete symptoms activity diagram depicts the steps taken by the administrator to delete symptoms that have been previously stored in the system. This process allows the admin to manage data by deleting irrelevant or unnecessary symptoms, and once completed, the admin will return to the symptoms menu in the system. Meanwhile, the add-symptom activity diagram presents the steps that the administrator needs to follow to add a new symptom to the system. By clicking the add symptom button, admin can enter various symptoms based on certain input or criteria. This feature makes it easy for administrators to update or add new symptoms to the database, allowing the system to continue to develop according to existing needs. Furthermore, the relationship activity diagram provides an overview of the process involving administration in managing work-stress relationship data for employees. Admins can use this feature to add, edit, search, or delete relationships related to work stress among employees. This feature provides flexibility for administrators to understand and manage the relationship between various aspects of work stress that have been identified in the system. With this set of activity diagrams, the system gives administrators access to features that enable them to manage and control various aspects of work stress data more efficiently. This makes it easier for administrators to carry out administrative tasks and provides the opportunity to manage and update relevant data according to system requirements.

In the implementation phase after the trial results, system testing was carried out using the black-box testing method. This approach focuses on testing functional specifications without examining design details and program code. The main goal of black-box testing is to ensure that the functions, input, and output of the software comply with established specifications. The system testing process involves four testers who play an important role. First, the author carried out independent testing to identify potential errors related to implementation aspects and system functionality. Expert work stress psychologists then conduct testing to confirm the precision of the diagnoses generated by the system and to guarantee that the results produced are in line with industry knowledge standards. Experts also carry out black-box testing in addition to that. The purpose of the testing they carry out is to find possible errors that may arise due to writing errors or errors in the programming process. The black-box testing process is carried out by running an expert system and inputting relevant data, then observing the resulting output. This aims to ensure that the system responds correctly to the input provided in accordance with previously established expectations and needs. By involving a variety of testers with different backgrounds and expertise, black-box testing becomes important in finding and fixing potential errors or inconsistencies in the system that may have been overlooked during the development process. This process is a critical step to ensure that the system runs according to the expected specifications and provides accurate and reliable results in making diagnoses related to employee work stress.

The work stress diagnosis expert system trial was carried out with the aim of evaluating the extent to which the expert system conformed to the knowledge standards held by experts in the field. One of the employees gave his response to the system being tested. This expert system for diagnosing employee work stress is easy to understand and can be processed quickly without experiencing delays. The process he revealed starts with registration as usual, where if you don't have an account, the user must register first. After having an account, the next step is to enter the system to carry out consultations regarding work stress diagnosis. The opinions expressed provide a positive picture regarding the ease of use and responsiveness of the system. The statement that this system is easy to understand and can be processed quickly without delay shows that the system can provide a good experience for users when conducting consultations regarding employee work stress. This testimonial provides a positive picture regarding the ease of accessibility and use of expert systems, which is an important factor in the success and acceptance of the system in the work environment.

## 4. Conclusion

Based on the summary of research results related to expert systems for diagnosing employee work stress, there are several important aspects that can be concluded. First, the system uses the certainty factor method, which is proven to be easy for users to understand in the process of presenting questions and diagnosis results. However, there are notes regarding deficiencies that have been revealed, namely that employees only need to select symptoms without providing a symptom value. This causes a limited understanding of the data processing of symptoms, causes, and solutions by users. Second, this system shows consistency in providing the answers it produces. According to the experts' information, users receive consistent diagnosis results when choosing the same symptoms. This indicates that the system is able to provide consistent and accurate responses to the symptoms selected by the user, which significantly increases confidence in the validity of the results produced. However, from these conclusions, it can be seen that this expert system provides easy understanding for users in the process of presenting and diagnosing results. There are shortcomings related to the lack of information regarding symptom values, which should be

considered for improvement in order to increase user understanding of the data processing process further. However, consistency in diagnostic results is an important point that increases the system's reliability in providing consistent, accurate, and trustworthy answers, in line with the views and expertise of experts.

The expert system that has been created still has room for further development in order to increase its advantages and overcome the limitations encountered. The author really hopes that this system can be improved so that it reaches a higher level of perfection. Some of the suggestions expressed by the author for improving and developing the system include two important key aspects. First, there needs to be additional diagnoses related to employee work stress so that they are not limited to the four existing work stress diagnoses. Besides that, increasing the number of symptoms identified in the system is also crucial to providing a deeper understanding of the symptoms of work stress. It is hoped that this effort will provide more comprehensive and effective diagnostic results for users. Second, as a further development step, the author suggests that this expert system can be adapted into an Android application. By presenting this system on the Android platform, it is hoped that the system will be easier to access and use by users with various types of mobile devices. This step is also expected to increase affordability and user comfort in using the system, considering the popularity and diversity of Android devices that are widely used by the public. By implementing these suggestions, it is hoped that the expert system for diagnosing employee work stress will become more flexible, broader in scope, and more accessible to users. More than that, the use of Android applications is expected to improve the quality of services provided by the system in carrying out diagnoses related to employee work stress.

## References

[1] Aswati, S., Ramadhan, M. S., Firmansyah, A. U., & Anwar, K, "Analysis Study of the Rapid Application Development Model in Information Systems Development," *MATRIK*, pp. 20-27, 2017.

[2] Pramudito, D. K., Ahmad, N., Suwanda, R., Zakaria, M., & Judijanto, L. (2023). Designing an E-Recruitment Information System Using Simple Additive Weighting Method for Employee Recruitment in Banking Industry. *Jurnal Informasi Dan Teknologi*, *5*(4), 19-25.

[3] Cahyono, L. O., Rahmad, C., & Affandi, L, "Expert System for Diagnosing Potted Fruit Plant Diseases Using the Web-Based Dempster Shafer Method," *Jurnal Teknologi Informasi*, pp. 118, 2017.

[4] Hamidi, R., Anra, H., & Pratiwi, S. H, "Comparative Analysis of Expert Systems with the Certainty Factor Method and the Dempster Shafer Method in Rabbit Diseas," *Jurnal Sistem dan Teknologi Informasi (JUSTIN)*, pp. 80-85, 2017.

[5] Sarah, S., Aswita, D., Ainun, N., Maulidar, M., & Azzarkasyi, M. (2022). The development of HOTS-based assessment instruments on educational statistics. *International Journal of Trends in Mathematics Education Research*, *5*(1), 38-43.

[6] Jefriyanto, J., Ainun, N., & Al Ardha, M. A. (2023). Application of Naïve Bayes Classification to Analyze Performance Using Stopwords. *Journal of Information System, Technology and Engineering*, *1*(2), 49-53.

[7] Ainun, N., & Jefriyanto, J. (2023). Development of Kirchoff's Law Drawing Tools to Improve Student's Science Skills in Learning Process of Direct Flow Circuits. *Journal of Information System, Technology and Engineering*, *1*(2), 32-37.

[8] Mahdalela, R., Ainun, N., & Roslina, R. (2022, December). An Analysis of Students' Mathematical Communicative Skills in Solving Sets Problems at SMP Negeri 1 Darul Hikma Aceh Jaya. In *Proceedings of International Conference on Multidiciplinary Research* (Vol. 5, No. 2, pp. 70-81).

[9] Suryawati, I., Rahmani, R., & Ainun, N. (2022, November). Students' Mathematical Communication Ability through Blended Learning Model for Elementary School Students in Banda Aceh. In *Proceedings of International Conference on Multidiciplinary Research* (Vol. 5, No. 1, pp. 53-57).

[10] Mardiah, A. (2019). The Influence Of Store Layout, Interior Display, And Human Variable Related To Shopping Orientation At Matahari Basko Grand Mall Padang. *Jurnal Ecogen*, *2*(1), 27-33.

[11] Sudirjo, F., Syamsuri, H., Mardiah, A., Widarman, A., & Novita, Y. (2023). Analysis of The Influence of Customer Perceived Benefit, Ease of Use and Sales Promotion on The Decision to Use Digital Wallets for Shopeepay Customers. *Jurnal Sistim Informasi dan Teknologi*, 63-68.

[12] Budiarto, B. W., Haes, P. E., Nawarcono, W., Mardiah, A., & Apriyono, T. (2023). The Influence Of E-Customer Satisfaction, E-Service Quality And Sales Promotion On E-Customer Loyalty Of Tokopedia Customers. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(6), 2472-2479.

[13] Bilgies, A. F., Tawil, M. R., Mardiah, A., & Arief, I. (2023). Analysis of The Influence of Online Consumer Reviews, Seasonal Digital Advertising and Celebrity Endorsers on Repurchase Intention of E-Commerce Consumers. *Jurnal Informasi dan Teknologi*, 26-32.

[14] Ariawan, J., Tarigan, B. A., Mardiah, A., & Siahaan, F. S. (2023). Analysis of The Influence of Burnout, Job Satisfaction and Organizational Commitment on Turnover Intention of Electronic Manufacturer Employees in Indonesia. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(5), 2016-2020.

[15] Setyawan, A. A. (2022). Effect of Quality Management Practices, and Digital Innovation on Organizational Performance Mediated by Competitiveness Strategy and Moderated by Industrial Collaboration at Vocational Colleges in Indonesia. *ITALIENISCH*, *12*(2), 1096-1100.

[16] Setyawan, A. A., Prabowo, H., Simatupang, B., & Pradipto, Y. D. (2023). The Influence of Quality Management Practices and Digital Innovation on Organizational Performance Mediated by Competitiveness Strategy and Moderated Industrial Collaboration in Vocational Higher Education in Indonesia. *Tec Empresarial*, *18*(1), 398-403.

[17] Widjayanti, C. E., Setyawan, A. A., & Racma, D. F. (2021, December). Philanthropy Model with Income Redistribution as an Alternative Solution for Women Victims of Layoffs Affected by Covid-19. In *Prosiding University Research Colloquium* (pp. 509-516).

[18] Wijayanti, C. E., Wibowo, A., Suyudi, S., & Setyawan, A. (2020). Hubungan Efisiensi dan Efektifitas dengan Kepuasan Pengguna Sistem Pendukung Keputusan Pemberian Penghargaan Bagi Karyawan Pada Pabrik Plastik" Sukses Mandiri" di Sokaraja Wetan. *Jurnal HUMMANSI (Humaniora, Manajemen, Akuntansi)*, *3*(1), 47-55.

[19] Dharta, F. Y., & Chaerudin, D. R. (2023, June). Using Digital Marketing Communications to Boost SMEs' Local Economic Growth in Karawang Regency. In *ICEMBA 2022: Proceedings of the International Conference on Economic, Management, Business and Accounting, ICEMBA 2022, 17 December 2022, Tanjungpinang, Riau Islands, Indonesia* (p. 101). European Alliance for Innovation.

[20] Dharta, F. Y., Prasetyo, H., & Dema, Y. (2021). Influence of attitude on online impulse buying: perspective on marketing communication. *Jurnal Studi Komunikasi*, *5*(3), 729-745.

[21] Hos, J., Kusujiarti, S., Jumintono, Upe, A., Arsyad, M., Hasniah, ... & Natanson, J. (2022). Conflict Management in Multiethnic Communities: a Case Study in Southeast Sulawesi, Indonesia. *Journal of International Migration and Integration*, *23*(4), 1963-1985.

[22] Nursanti, S., Dharta, F. Y., Chaerudin, C., Syam, S. P., & Purnama, R. N. (2022). Generation z's perceptions of health information about the Covid-19. *Jurnal Studi Komunikasi*, *6*(2), 587-602.

[23] Siswanto, A., Pratiwi, R., Rokhmawati, D., & Dharta, F. Y. (2023). Analysis Of Determinant Factors Employee Performance Of Directorate General Of Intellectual Property Rights Republic Of Indonesia. *JEMSI (Jurnal Ekonomi, Manajemen, dan Akuntansi)*, *9*(6), 2493-2498.

[24] Jumainah, J., Paramansyah, A., Rohmiyati, Y., Boari, Y., & Nurnaningsih, A. (2023). The Relationship Analysis Between The Index Card Match Learning Model and Students' Activeness and Memorizing Capability. *Journal on Education*, *6*(1), 1369-1374.

[25] Junaedi, D., Norman, E., Salistia, F., Arsyad, M. R., & Paramansyah, A. (2022). The Analysis of the Impact of Debt on the Indonesian Economy for the Period 1976-2021. *ManBiz: Journal of Management and Business*, *1*(1), 1-18.

[26] Norman, E., Paramansyah, A., Utami, W., & Aminah, S. (2022). SWOT Analysis as a Strategy for Madrasah Principals in Realizing Academic Madrasah. *Al Tanzim: Jurnal Manajemen Pendidikan Islam*, *6*(02), 520-530.

[27] Norman, E., Paramansyah, A., & Abdan, M. S. (2022). The Role of Organizational Culture in the Effectiveness of School Organizations. *Da'watuna: Journal of Communication and Islamic Broadcasting*, *2*(3), 254-269.

[28] Paramansyah, A., Hamzah, H., Putra, R. P., Direja, A. H. S., & Zamakhsari, A. (2023). The Impact of Parents Training Program for the Psychosocial Development of Autism Spectrum Disorder Students. *Journal on Education*, *6*(1), 6147-6154.

[29] Fitriyatul Bilgies, A., Risal Tawil, M., Mardiah, A., Jusatria, & Arief, I. (2023). Analysis of The Influence of Online Consumer Reviews, Seasonal Digital Advertising and Celebrity Endorsers on Repurchase Intention of E-Commerce Consumers. *Jurnal Informasi Dan Teknologi*, *5*(4), 26-32.

[30] Sovia, & Ginting, G, "Expert System Application to Identify Formalin Content in Food Using the Certainty Factor Method," *Pelita Informatika*, pp. 102-107, 2018.

[31] Turyadi, I., Zulkifli, Z., Tawil, M. R., Ali, H., & Sadikin, A. (2023). The Role Of Digital Leadership In Organizations To Improve Employee Performance And Business Success. *Jurnal Ekonomi*, *12*(02), 1671-1677.

[32] Suriadi, S., Rafid, M., Zulkifli, Z., Abdurohim, A., & Damirah, D. (2023). The Influence of Organizational Culture, Work Environment and Work Discipline on Job Satisfaction of Teachers at Boarding School. *Journal on Education*, *5*(4), 14777-14781.

[33] Aziz, F., Mayasari, N., Sabhan, S., Zulkifli, Z., & Yasin, M. F. (2022). The Future of Human Rights in the Digital Age: Indonesian Perspectives and Challenges. *Journal of Digital Law and Policy*, *2*(1), 29-40.

[34] Taufiq, & Natarsyah, S, "Implementation of Certainty Factor in an Expert System for Diagnosis and Therapy of Mental Disorders," *JUTISI*, pp. 1214, 2016.