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An evaluation of the Efficacy of the Human Resource Data Analytics on Artificial Intelligence Program

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Abstract: - The primary purpose of this study is to investigate the advancement of data analytics application programs in human resources, along with the challenges faced by data analytics in significant artificial intelligence throughout the industrial era 4.0 in Indonesia. Data collection is facilitated through the administration of questionnaires, conducting interviews, and administering surveys. This inquiry aims to establish the feasibility of substituting human intelligence with computer intelligence. This undertaking is predicated on the idea that individuals and machines possess commensurate abilities to handle vast quantities of data. The chosen strategy for analytics is problematic from a qualitative standpoint. The reason for this phenomenon is the adoption of the method. Based on the research outcomes, it has been observed that within the context of the fourth industrial revolution, data analytics can be effectively managed by robots possessing extensive data storage capabilities comparable to human counterparts. This applies to all facets of human intelligence, particularly weak Artificial Intelligence.

Keywords: evaluation, analytics, data, intelligence, human resource, machines

Introduction

The previous decade has witnessed substantial transformations in human existence, primarily driven by rapid technological progress. The proliferation of advanced technology in using intelligent mobile devices has significantly enhanced the convenience of communication across diverse entities. This has profoundly impacted the exchange of data and information across interconnected parties, resulting in a substantial surge in economic growth compared to the previous decade. Marr (2017) posits that the transmission of data and information is instigating a significant transformation, not only in our global landscape but also in our lifestyles and occupational pursuits. The current state of affairs can be interpreted in two contrasting ways. On one hand, it can be seen as the commencement of a highly stimulating phase (Depari et al., 2022).

On the other hand, it can be perceived as the onset of a disconcerting era reminiscent of Big Brother, wherein our actions are constantly monitored and even anticipated (both sides). This has sparked a debate among us and our professional associates regarding the suitability of the stance adopted (Febriani et al., 2023). In contemporary business settings, leaders and managers face significant time constraints that limit their ability to thoroughly scrutinize the potential uncertainties associated with data (Melissa et al., 2023). The utilization and organization of data have significantly transformed the operational dynamics of enterprises, and these two functions are poised to assume even greater importance for the sustained survival of all organizations in the foreseeable future. According to Suryadi and Rambe (2023), organizations that perceive data management and presentation as strategic assets are the ones that will persist and thrive in the future. The significant expansion of Big Data and the Internet of Things in the contemporary era of Industry 4.0, along with the swiftly advancing techniques for data management and visualization for data analytics (Depari et al., 2022), illustrates the crucial role of data management and presentation in all aspects of business (Zara et al., 2023). Furthermore, this significance is anticipated to further escalate in the foreseeable future.

The significance of human resources in generating data and information and their role in the establishment and longevity of organizations has been acknowledged for centuries (Ayunindya, 2023; Nijjer & Raj, 2021). This

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encompasses using data analytics by management to transform traditional approaches to human resource management, fostering current data-driven capabilities across all facets of the organizational landscape.

Furthermore, Nijjer and Raj (2021, p. 4) assert that integrating data analytics inside business operations is commonly perceived as a constituent element of business intelligence (BI). The phrase "business intelligence" (BI) is employed as a comprehensive concept, including all aspects of data analytics, reporting, management, and data display (Sundara et al., 2023). The resource above offers comprehensive solutions for various applications, infrastructure, materials, and equipment. Additionally, it encompasses the utilization of best practices employed by companies to acquire information, enhance adaptability to evolving needs, extract data, and facilitate optimal decision-making within the organizational context (Rosa et al., 2023). The term "data analytics" is commonly employed as a broad term that encompasses both "business analytics" and "data analytics." These two approaches are utilized to collect business insights (Mauladi & Gultom, 2023) and to understand their significance and contextual relevance within the broader business environment (Nijjer & Raj, 2021).

Despite its utility, many firms have a narrow perspective while engaging in data analytics, focusing primarily on individual-level data while neglecting the dynamics of interpersonal interactions. The "Analytical Relationalization" phenomenon involves examining the interconnected interactions within HR Analytics. Regardless of the specific data being communicated inside an organization, many means of communication are employed, such as email, organizational communications, file transfers, and similar methods (Nijjer & Raj, 2021, p. 27). The concept of HR analytics is commonly understood as a framework that encompasses the sharing of data through interpersonal communication. According to the study by Nijjer and Raj (2021), business analytics is commonly perceived as a dynamic association that signifies the exchange of information or resources.

Mondy and Martocchio (2016) assert that the relationships among individuals in data analytics can be categorized into three distinct types within global data exchange relationships (p. 295). The aforementioned groups can be categorized as follows:

- The initial group is at the forefront of employing global data analytics and reaping the advantages of government-provided data (Hamboer et al., 2023)

- the second group, which benefits from data analytics that is required by governmental regulations (Hamboer et al., 2023)

- The third group, which voluntarily benefits from data analytics (Rahmawan & Romli, 2023)

Hence, it is imperative for an organization to initially formulate a strategic approach towards harnessing the advantages of data analytics and establishing a distinct corporate identity regarding fundamental data analytics while considering implementing a comprehensive benefits package within a global context. The second step a corporation should undertake is to develop a strategic approach for harnessing the advantages of data analytics and establish a comprehensive plan for acquiring the benefits associated with data analytics (Mondy & Martocchio, 2016).

Literature Review

Lozny and McGovern (2019) argue that within a global context, the interactions among societal ties have become very complicated due to the influence of data analytics. This pertains to the ongoing nature of interactions among individuals in the context of data analytics utilization. Schühly (2022) asserts that contact when viewed from a long-term viewpoint, involves preserving a combination of relationship sustainability while adapting to the prevailing cultural changes. The objective of this endeavor is to ensure the long-term viability of both entities. Longitudinal studies of this nature provide novel insights into the strategies employed by global communities to address a diverse range of difficulties that periodically arise (Yorks et al., 2022). The authors highlight the challenging environmental adjustments resulting from changing dynamics between local and regional community authorities and recurring international political issues linked to resource management policies encompassing water, soil, grasslands, forests, and entire ecosystems (Hampson & Narlikar Amrita, 2022). The difficulties above are intricately linked to the management regulations about water, soil, grasslands, and forests. However, it has been demonstrated that the assimilation of the prevailing culture, as previously discussed, and functioning at an

ideal capacity, such as a resilient system for production and data sharing, can engender constructive reciprocal interactions (Asprion, Schneider, & G, 2018). The associations above can be observed during significant disruptions, such as droughts, climate fluctuations, market disruptions, or political conflicts worldwide (Lozny & McGovern, 2019).

King and Vaiman (2019) argue that global changes necessitate implementing global talent management (GTM) to adapt to these changes and facilitate individual interactions effectively. According to King and Vaiman (year), the challenges brought about by global transformations need the implementation of global talent management strategies. According to Miller-Merrell (2022), effective global talent management is expected to yield favorable outcomes by leveraging human resources as a strategic asset for organizations, generating positive value. The coordination of management activities is facilitated by the strategic decisions implemented by human resource management (Malik, 2022). The primary emphasis of the GTM holds considerable importance for the organization.

Nevertheless, for the GTM to yield desired outcomes, the organization must not solely oversee talent within its internal structure but also comprehend, assess, and exert a certain degree of control over the broader external cultural shifts that shape talent management. This extends to the macro level, surpassing the confines of the organization itself (King & Vaiman, 2019). It is imperative to adhere to governmental policies that promote the cultivation of global talent management, both in terms of quality and quantity, on a national scale (Miller-Merrell, 2022). This can be achieved by implementing specialized state agencies dedicated to enhancing the proficiency of employees' skills and education (Wu, 2020). Alternatively, it can also be accomplished by integrating workforce quality development initiatives conducted by other state agencies. The approach entails adhering to these established guidelines. According to Miller-Merrell (2022), the impact of companies on talent management recruitment strategies is contingent upon their influence not only at the organizational level but also on a broader scale, encompassing the availability and supply processes of talent management. According to King and Vaiman (2019), this represents the sole means by which businesses can attain such a magnitude of power.

When selecting global management talent, various stakeholders such as executives, management consultants, job placement consultants, career training providers, and business training services play a crucial role. These entities aim to comprehensively grasp the notion of suitability from the perspective of talent candidates and providers. The process of placing individuals in suitable positions is carried out based on established practices, as indicated by Webb (2020), who draws upon three decades of experience in this field. Marchington and Wilkinson (2021) argue that human resources are crucial in distinguishing successful corporations from failing enterprises. According to Karasan (2022), technology and finance are the remaining two significant components. This phenomenon is particularly evident within the service sector, where personnel are the primary interface between clients and the organization. This interaction occurs either in person when delivering services or through remote channels such as telephone or internet communication (Webb, 2020). The management of human resources is widely recognized as a critical element in the production process, even within manufacturing enterprises (Marchington & Wilkinson, 2021). This assertion holds particular validity regarding ensuring the caliber and reliability of the outcome. The allocation of responsibilities for individuals is predominantly contingent upon the extent to which they are allowed to exercise their creative abilities autonomously (Webb, 2020).

In the contemporary period of globalization, talent management cannot be disentangled from the economic and commercial interdependencies that prevail among nations (Miller-Merrell, 2022). According to Nankervis et al. (2020), "globalization" describes the increasing velocity of economic and cultural interconnectedness across nations. The value of global trade has not only increased in the last twenty years, but the interdependence among nations has also intensified due to the greater utilization of global supply chains. As per the World Trade Organization's (WTO) definition, the international supply chain refers to the process wherein exchanging goods and services incorporates raw inputs from many nations. Based on the data presented by Lozny and McGovern (2019), re-exports of intermediate product inputs constitute around 30% of the total volume of global commerce. Additionally, it functions as a gauge of the global correlation in data analytics (Yorks et al., 2022), a domain that has experienced significant growth in significance throughout recent decades (Nankervis et al., 2020).

Amidst the increasing interconnectedness of nations worldwide, the demands and intricacies within the realm of industry regarding economic and commercial sectors have demonstrated a consistent growth pattern in recent years (Demir et al., 2021, p. 21). The swift advancement of technology, the fierce competition in the market, the growing volatility of global marketplaces, the escalating demand for highly personalized products (Manrique, 2021), and the surging prevalence of products with limited lifespans collectively present substantial challenges for businesses (Kaplan, 2022). The chosen technique involves establishing a cost-efficient, adaptive, reliable, and sustainable supply chain within the trading relationship (Demir et al., 2021). Nations with well-established industrial sectors are responsible for adhering to the Industry 4.0 advancement agenda to maintain their sustainability level (Nawaz & Koç, 2020). The plan encompasses the adoption of this innovative concept, which entails the implementation of highly adaptable and well-coordinated production processes, as well as the achievement of real-time system optimization. These efforts aim to generate cost savings and facilitate the emergence of fresh business models (Demir et al., 2021). The technological breakthrough discussed in this context enables real-time material flow monitoring, continual material handling improvement, and effective risk management through various applications of Industry 4.0. These advancements have the potential to exert a global influence.

In globalization, the significance of data management and presentation is beyond dispute (Miller, 2022). Since the advent of the early 2000s, utilizing Big Data has facilitated the widespread application of data globally (Nasrollahi & Fathi, 2022). The ability to store data through cloud computing and the growing prevalence of digital technology have facilitated this advancement (Gahi & El Alaoui, 2021). During the initial years of the 2010s, the widespread use of data analytics technology granted businesses the ability to harness Big Data. Consequently, this facilitated the development of specific strategies by businesses to proactively predict trends and anticipate the behaviors of individuals (Nawaz & Koç, 2020). In contemporary society, there is a growing trend among enterprises and communities to rely on the utilization of extensive data management as a means to facilitate decision-making processes (Depari et al., 2022).

Conversely, the potency of this data is often subject to attacks aimed explicitly at Big Data platforms (Alaoui et al., 2020). Vulnerabilities associated with virus attacks persist throughout all levels of the Big Data platform, including the data analytics stage, despite the considerable efforts and resources invested by Big Data tools and providers. The frequency of virus attacks on big data is anticipated to rise, requiring protective measures such as security protocols and advanced cryptographic techniques (Gahi & El Alaoui, 2021).

In the study conducted by Alaoui, Aksasse, and Farhaoui (2020), it is posited that safeguarding big data and data analytics is intricately connected to data mining. Data mining is the analytical method of extracting valuable knowledge from large volumes of Big Data. Data extraction and analysis hold numerous potential applications, encompassing sectors such as telecommunications, business, marketing, biological data analytics, and various scientific domains (Depari et al., 2022). In data analytics, researchers have access to a wide range of analytical tools sourced from many open platforms, which are readily accessible for utilization inside data mining frameworks commercially available. Among these tools, Weka, KNIME, Orange, and RapidMiner have been identified as particularly robust and influential (Meunier, 2020). The subsequent section provides an overview of the data mining toolset that is encompassed within the program. Weka, an acronym for Waikato Environment for Knowledge Analytics, is a software application that uses machine learning principles to conduct data analytics (Alaoui et al., 2020). The development of this application can be attributed to the University of Waikato in New Zealand. The program exhibits a considerable degree of complexity and can facilitate diverse data processing activities, such as clustering, classification, regression, visualization, and feature selection (Asprion, Schneider, & G, 2018).

Being distributed under the General Public License, Weka offers users the advantage of cost-free usage and facilitates their interaction with SQL databases through the program's interface. Access to the data above can be obtained by utilizing the explorer interface commands, as indicated by Alaoui, Aksasse, and Farhaoui (2020). Orange is a data analytics tool that utilizes the Python programming language and can process diverse datasets gathered from various sources of big data (Gahi & El Alaoui, 2021). This application possesses significant capabilities and may be effectively employed by users across various proficiency levels, from novices to seasoned

specialists. The software above provides a comprehensive range of data analytics components (Alaoui et al., 2020).

Furthermore, it encompasses an extensive array of data analytics components encompassing several aspects like data preprocessing, feature filtering, model development, model evaluation, and investigation of processing approaches. The data analytics platform KNIME, short for "Konstanz Information Miner," is an open-source software designed to be user-friendly. It was developed using the Java programming language and built on the Eclipse framework. The KNIME platform facilitates the analysis of reporting and data integration in a user-friendly and intuitive manner. According to Gahi and El Alaoui (2021), this software program allows users to enhance data evaluation by incorporating additional functionality by integrating plug-ins. This capability empowers users to extend the application's capabilities. The programming language utilized by RapidMiner, an application designed for environmental data analytics, is Java. The main functionalities of this system encompass machine learning and the execution of comprehensive data experiments (Alaoui et al., 2020). Karasan (2022) states that this software provides enhanced data analytics capabilities using a template-based structure. Moreover, it can be employed for research endeavors and practical data evaluation assignments, encompassing data preprocessing and visualization, predictive analytics, and developing statistical models, assessment, and data utilization for decision-making purposes (Alaoui et al., 2020).

The linkage between data analytics and the Industrial Revolution discussions is inseparable since it has become a prominent subject of discourse in contemporary times, particularly within the past few years (Eubanks, 2022). The original emergence of the term "Industry 4.0" (abbreviated as I4.0) in countries where German is the predominant language can be attributed to an initiative undertaken by the German government. According to the study conducted by Asprion, Schneider, and Frank G. in 2018, Developed nations, particularly those with substantial economic resources, employ technological advancements to remain competitive and effectively administer information systems, hence maintaining a leading position in the market (Bettiol et al., 2020). The term "cyber information systems" refers to the common practice in developed countries of combining digital data with the natural world to achieve a specific goal (Demir et al., 2021). The system in question serves as the predominant catalyst for the advancement of the Fourth Industrial Revolution. This revolution encompasses various advancements, including the utilization of the Internet as a comprehensive platform for all activities, the integration of the Internet of Things (IoT), the analysis and utilization of large-scale data sets (big data), and the incorporation of augmented reality (AR) into the German context (Asprion, Schneider, & G, 2018).

Research methods

The research methodology employed in this study is a concerning approach that assesses (1) the correlation observed in a data analytics problem with significant implications for the stability of crucial societies and organizations. Therefore, it necessitates careful attention to develop an analytical solution model that aligns with the requirements of HR data analytics concerning global concerns. Additionally, (2) it aims to provide practical and pragmatic resolutions to the identified problem.

The Trobling methodology employed in this investigation was devised through a dialogue between the researcher and the informant, primarily aiming to uncover causal relationships and outcomes through qualitative narratives. This study examines the problematic approach of a model that highlights qualitative contradictions and ironies, employing a pragmatic, critical, and feminist lens. The preparation process involves utilizing a problem method model that incorporates the fundamental principle of the third path ideology. This method emphasizes three key aspects:

1. Establishing relationships to identify cause-and-effect relationships

2. Actively listening to gather all necessary information

3. Embracing a state of not knowing in order to generate genuinely innovative solutions

The preparation is conducted in this manner.

Discussion

The Indonesian National Police has led a collaborative capacity-building program between Australia and Indonesia, enhancing equipment provisions for the Indonesian police force. Burhansyah A (2016) proposes various measures to address cyber crimes, encompassing unauthorized access to computer systems and services, illegal content, data falsification, cyber espionage, sabotage, cyber extortion, attacks against intellectual property, privacy breaches, gambling, cyber porn/cybersex, cyber stalking, hacking, and carding. The increasing prevalence of data analytics has led to a greater recognition of the importance of privacy protections in the context of international agreements on data sharing (Mondy & Martocchio, 2016, p. 295). Relational analytics refers to analyzing interactions among individuals through various means, such as electronic mail, internal company communications, file sharing, and similar channels (Nijjer & Raj, 2021, p. 27).

The initiative outlined above, in response to global changes in data protection, initiated a transformative shift within the Indonesian Police, leading to a managerial revolution (Burhansyah A, 2016). According to Asprion, Schneider, and G (2018), the process of digitizing data that was previously managed manually has led to the establishment of an integrated management system. This development can be seen as the initiation of a managerial revolution. The progress of Information Technology (IT) has facilitated this technical advancement, representing a noteworthy scientific accomplishment (Eubanks, 2022). Conventional information technology, which organizations have employed since the 1980s (Bettiol et al., 2020), is subject to constant upgrades. Before that point, enterprise information technology (IT) was employed to develop software customized to fulfill the requirements of many departments inside an organization, such as human resources, finance, production, and marketing. According to Burhansyah (2016), technological progress has facilitated the utilization of a centralized database by departments, enabling straightforward solutions to enhance management operations across different departments.

Enterprise Resource Planning (ERP) is a comprehensive company management program encompassing several functionalities (Asprion, Schneider, & G, 2018). This software integrates multiple aspects of an organization's operations into a unified system (Depari et al., 2022). According to Ismail (2022), this application challenges the traditional approach to product development by offering a consolidated platform that supports multiple applications to achieve diverse business goals. It also emphasizes the significance of software intelligence in generating unique product value while serving as a centralized database for efficient management. According to Ayunindya (2023), the individual was in solitude.

Implementing information management strategies can yield significant advantages for enterprise resource planning systems (Budhiharjo & Ananda, 2022). Ghavami (2020) posits that Big Data Analytics endeavors to tackle three key concerns, and it is imperative to recognize that advancements in ERP are intricately linked to these endeavors (Darmawan, 2022). Understanding past, present, and future events can be achieved by addressing the inquiries posed by Zara, Wahyudi, and Widjanarko (2023). The utilization of retrospective data analytics enables the illumination of past events, identification of patterns, and determination of causal factors (Ismail, 2022). According to Burhansyah (2016), real-time data analysis provides valuable insights into the present conditions. This data analysis aims to ensure preparedness for environmental variations, such as the necessity to furnish data management replies that reach a designated threshold status or comply with specified change rules (Rony, 2022). In the realm of analytics, prospective data analytics serves as a natural extension, focusing on forecasting and anticipating future outcomes. According to Ghavami (2020), using data analytics enables the generation of predictions regarding future events, including the potential shifts in the values of certain variables.

The current stage of development for this application is the integration of data analytics in Indonesia through the utilization of AI-based applications, resulting in the establishing of an offline learning system (Sutarna, 2022). A report by Halim and Prasetyo (Halim & Prasetyo, 2018) asserts that the present software application simulates artificial intelligence (AI) in operation, facilitating the execution of programs coded in the C programming language. Furthermore, the integration of the filtering process is embedded into the introductory segment of the courseware. The presence of inaccuracies in the initial version of the C programming language used for illustrating algorithms is evident in how analytical data is presented. A classroom educator could utilize this tool to store and organize lesson plans and supplementary instructional resources. Furthermore, the Courseware C program can

process data by many means, such as employing artificial intelligence techniques in sophisticated computers and accessing and manipulating data through an application interface. Determining the most problematic feature is contingent upon the courseware chosen by students in the classroom setting. This selection then establishes the parameters Wi (where i ranges from 1 to n), Cj (where j ranges from 1 to n), and Hk (where k ranges from 1 to n). Per the prescribed rules, the weight Hk (k = 1.2,...... n) is allocated to signify the student's preference for all data points that possess accurate values (Halim & Prasetyo, 2018). Simultaneously, the function f is defined in terms of the relative importance of its parameters (Febriani et al., 2023). Each student would possess a distinct collection of multimedia files denoted by names such as "file 1.exe," "file 2.exe," "file M.exe" (assuming that the document includes M), and so forth. These files would be utilized by the students based on a set of selection rules as follows:

If the value of PI is equal to 1, execute the file l.exe.

If the value of PI is equal to 2, execute the file2.exe program. Otherwise, proceed with the next instruction.

By adhering to the protocols above, students can effectively employ the functionalities of intelligent machines in the processing of data, hence affording teachers greater flexibility to modify their instructional approaches in response to real-time feedback received from students (Halim & Prasetyo, 2018).

The integration and implementation of data analytics in various aspects of our everyday lives and work environments have been facilitated by the swift progress of communication technology, as exemplified by the aforementioned multimedia apps (Zara et al., 2023). Based on the research conducted by Hua, Wang, and Hu (2021), it is suggested that the utilization of compressed digital video information will become the sole viable choice for long-term communication, considering the present condition of multimedia communication and its anticipated future advancements. According to Pratikno (2022), an extended duration. The core concept that drives data compression coding is the removal of unnecessary elements while preserving the desired visual perception (Halim & Prasetyo, 2018). The key emphasis of redundant information in video data is the duplication of space-time-vision, as described by Fahrizal (2022). According to Hua, Wang, and Hu (2021), the compression of video analysis data can be achieved by removing superfluous information and maximizing the utilization of symbols.

The field of human-computer interaction (HCI) has been extensively researched. It uses data analytics to examine the methods of communication between human users and computer systems, specifically focusing on the utilization of input/output devices in conjunction with supporting software. (Ismail, 2022; Fahrizal, 2022; Afiat, 2022). The participation of UGM scholars in this endeavor is motivated by its pertinence to their investigation of the interaction between human and artificial intelligence. The accuracy of Genose, as determined by a study conducted by Gajah Mada University (UGM, 2021), relies on the GeNose prediction approach for identifying COVID-19. This prediction process is founded upon analytical data that form the basis of computational intelligence. 1) The pre-processing of signal quality involves classifying data into three categories: standard, low, and invalid/inconclusive. This classification is achieved by enhancing analytic data extraction techniques applied to sensor features. 2) Enhancing AI performance through integrating data analytics windows that optimize the accuracy of extracting response characteristics by employing pattern classification techniques based on both regular and low signal inputs and excluding signals that are deemed invalid due to low variety and quality (Universitas et al., 2021). According to Halim and Prasetyo (2018), the analytical data processing outcomes of the Genose device exhibit its proficiency in identifying COVID-19 through the analysis of bodily analytics.

Conclusion

The complexities associated with data analytics in the context of globalized critical matters during the fourth industrial revolution and the obstacles faced in creating analytical data applications for human resources have made it unfeasible to substitute human intelligence with machines completely. In the Industrial Revolution 4.0, however, robots with incredibly huge data memory can entirely replace humans in every intellectual work. Based on the findings of this study, it has been observed that robots equipped with extensive data storage capabilities can conduct data analytics in the context of the industrial 4.0 era with a level of effectiveness comparable to that of human counterparts. This assertion remains valid in all areas of human intellect at the early period of weak Artificial intellect.

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