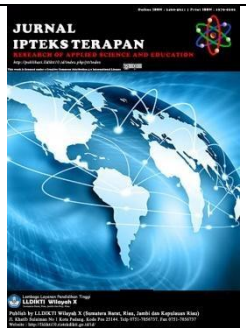

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COMPARATIVE ANALYSIS: THE INFLUENCE OF ARTIFICIAL INTELLIGENCE IMPLEMENTATION IN HUMAN RESOURCE MANAGEMENT ON EMPLOYEE PERFORMANCE

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Abstract

This research aims to examine the differences in the implementation of Artificial Intelligence (AI) in human resource management practices and its impact on employee performance. The study population consists of organizations in West Sumatra and its surrounding areas, with a distinction between those implementing AI and those that do not. Sampling was conducted using a Proportional Sampling technique, randomly selecting 14 organizations implementing AI and 33 organizations that do not. The research model employs Structural Equation Modelings (SEM) with Smartpls 3.29 for analysis. The findings, in general, conclude that HR practices such as recruitment, selection, development, training, and performance management do not exhibit significant differences in employee performance between the two types of organizations. However, evidence indicates that HR practices in performance management significantly influence employee performance in organizations implementing AI. On the other hand, there is also a significant influence of HR practices in recruitment and selection on employee performance in organizations not implementing AI. This research's results can serve as a reference for all organizations to assess the role of Artificial Intelligence (AI) in maximizing HR practices to support the achievement of more optimal organizational goals.

Keywords: Human Resource Management Practices, Artificial Intelligence, Employee Performance.

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INTRODUCTION

The impact of artificial intelligence (AI) on human resource management (HRM) has been an intriguing topic for researchers in recent years. Various researchers have conducted a comparative study on the impact of AI on Human Resource Management, indicating that AI applied to HRM is a growing field with constant growth and a positive future outlook. However, most research has focused on the implementation of AI in recruitment and selection actions, neglecting other areas of HRM, [1], [2] [3]. The literature predominantly centers on the analysis of AI application in personnel selection. AI-based HRM applications can bring significant changes to human resource management practices, [3]. According to a report from Bersin by Deloitte, the use of AI technology in human resource management has significantly increased in recent years. The report also indicates that around 33% of Fortune 500 companies have adopted AI technology in the recruitment and selection processes, [4]. In a new study, 64% of people trust AI more than their managers, further highlighting how global research underscores how AI is changing the relationship between humans and technology in the workplace, [5]. Contrary to common fears about how AI will impact jobs, employees, managers, and HR leaders worldwide report an increase in AI adoption in the workplace and many welcome AI with love and optimism. Here are the survey results stating the impact of AI usage, [5] :

a) AI has become more prominent, with 50 percent of current workers using some form of AI in the workplace compared to just 32 percent last year. Workers in China (77 percent) and India (78 percent) have adopted AI more than 2X as much as those in France (32 percent) and Japan (29 percent).
b) The majority (65 percent) of workers are optimistic, excited, and grateful to have robot (AI) coworkers, and almost a quarter report having a loving and satisfying relationship with AI in the workplace.
c) Workers in India (60 percent) and China (56 percent) are the most enthusiastic about AI, followed by the UAE (44 percent), Singapore (41 percent), Brazil (32 percent), Australia/New Zealand (26 percent), Japan (25 percent), the US (22 percent), the UK (20 percent), and France (8 percent).
d) Men have a more positive view of AI in the workplace compared to women, with 32 percent of men being optimistic compared to 23 percent of women.

Recent survey data from 2022 indicates that nearly 50% of HR practitioners expect efficiency facilitated by AI, enabling them to thrive within their organizations, [6]

Furthermore, global survey results contradict the findings above concerning whether there are concerns or main obstacles limiting organizations' interest or ability to adopt AI in human resource management, related to the impact on efficiency and organizational activities in human resource practices [7], as seen in Figure 1.

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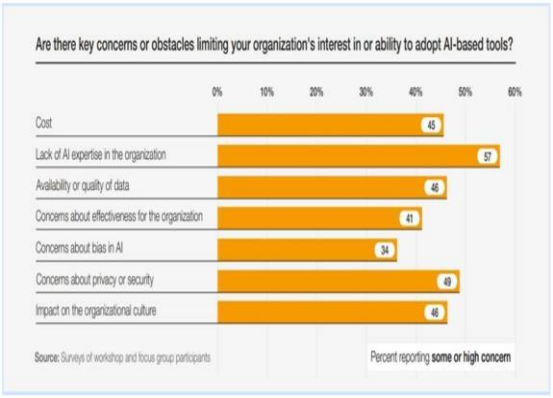

Source: World Economic Forum.

Figure 1. Survey of Concerns and Main Obstacles in AI Implementation

The results of this survey inform that the primary concerns or obstacles limiting the interest or capability of organizations to adopt AI in HR practices are highest, related to the lack of AI expertise within the organization at 57%, followed by concerns about privacy or security at 49%, followed by concerns about the availability or quality of data at 46%, followed by concerns about the costs incurred, concerns about effectiveness for the organization, and concerns about bias in AI, each at 45%, 41%, and 34%, respectively. This information leads to the conclusion that organizational barriers and concerns in adopting AI in human resource management practices are still relatively high. Based on the issues above, there is still a contradiction regarding the adoption of AI in organizations, especially concerning human resource management practices. Therefore, further research is needed regarding the utilization of AI in human resource management practices, not only directly related to the recruitment and selection of new employees but also related to the development and management of human resources and employee performance evaluation. Hence, the aim of this research is to identify and analyze the differences in the implementation of AI in human resource management practices concerning employee performance, a case study between organizations that implement AI and those that have not implemented AI in Padang and West Sumatra.

RESEARCH METHODS

Human Resource Management (HRM) is the practice of recruiting, hiring, deploying, and managing an organization's employees, [8]. HRM involves the recruitment of individuals, their training, providing compensation, developing policies related to them, and devising strategies to manage them, [9], [10]. Human resource managers plan, coordinate, and direct the administrative functions of the organization, including overseeing recruitment, interviews, and hiring of new staff, consulting with top executives on strategic planning, and serving as a liaison between organizational management and its employees, [11]. The role of HRM practices is to manage people within the workplace to help achieve the organization's mission and strengthen its culture. When done effectively, HR managers can assist in recruiting new professionals with the necessary skills to advance the company's goals and also aid in the training and development of current employees to reach objectives. Human Resource Management (HRM) is the practice of recruiting, hiring, deploying, and managing an organization's employees, [8]. HRM involves the recruitment of individuals, their training, providing compensation, developing policies related to them, and devising strategies to manage them, [9], [10].

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Human resource managers plan, coordinate, and direct the administrative functions of the organization, including overseeing recruitment, interviews, and hiring of new staff, consulting with top executives on strategic planning, and serving as a liaison between organizational management and its employees, [11]. The role of HRM practices is to manage people within the workplace to help achieve the organization's mission and strengthen its culture. When done effectively, HR managers can assist in recruiting new professionals with the necessary skills to advance the company's goals and also aid in the training and development of current employees to reach objectives. Human Resource Management (HRM) is the practice of organizing, coordinating, and managing employees within an organization to fulfill its objectives. Strategic human resource management is a specific approach to HRM that involves aligning HR practices with the company's goals and capabilities, [12]. There are various best practices in HRM, including recruitment and selection, training and development, performance management, as well as compensation and benefits, [13], [14]. Furthermore, best practices in human resource management (HRM) can help organizations achieve their goals through the performance generated by employees. These practices include providing job security to employees, selective recruitment, maintaining transparency, developing policies, aligning HR policies with business strategy, and setting realistic payroll budgets, [14]–[17]. HRM also involves investing in employees, ensuring their safety, managing all aspects of employment from recruitment to compensation and retention, and building a corporate culture that aligns with the organization's mission and goals. Effective HRM adds significant value to businesses and helps organizations successfully achieve their objectives, [16].

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines programmed to think and act like humans, [18]. AI involves tasks such as speech recognition, computer vision, and language translation, [19]. It is based on the principle that human intelligence can be defined in such a way that machines can easily mimic it and perform tasks, [18]. AI researchers have adapted and integrated various problem-solving techniques, including search and mathematical optimization, formal logic, artificial neural networks, and more recently, multimodal sentiment analysis, [19]. Machine learning is a subset of AI that refers to the concept that computer programs can automatically learn from and improve based on experience, [18], [20]. The long-term goal of AI is to develop machines with general intelligence that can solve a wide range of problems with breadth and versatility similar to human intelligence, [19]. Artificial Intelligence (AI) is increasingly being used in Human Resource Management (HRM) to enhance efficiency and effectiveness. AI-based HRM can help predict talent needs, automate recruitment processes, and analyze data related to job openings and new team requirements, [21]. AI can provide benefits and challenges for HRM from three perspectives: employees, companies, and society, [22]. Some AI applications in HRM include recruitment, employee engagement, and performance management, [23]. These conditions indicate that the presence of AI is highly

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beneficial in maximizing the execution and completion of tasks and jobs for employees in the workplace.

Performance can be interpreted as the result of an employee's job execution, both in terms of quality and quantity, concerning the responsibilities assigned to them in an organization. In essence, performance is the work achievement of an employee manifested through tasks performed, based on both quality and quantity considerations, [24], [25]. It is crucial for organizations to provide maximum support in the execution of tasks and employee duties, starting from the provision of facilities and infrastructure support, work systems, or a work culture that leads to the concept of knowledge sharing, impacting the birth of innovation in work, [25]. Therefore, organizations should also encourage the implementation of technology that can enhance job execution more effectively. Currently, the application of Artificial Intelligence (AI), such as digital computers, poses both a challenge and a necessity for organizations in aiding the completion of tasks with better and measurable results, [26], [25]. The implementation of AI in achieving employee performance is believed to increase the level of effectiveness and efficiency in job execution, where the accuracy and precision of repetitive or frequently performed tasks will be significantly assisted, [27], [28]. AI not only simplifies HR operations but also enhances the strategic importance of HR in the organization, [29]. Several roles of AI that can help in the execution of tasks and employee duties to achieve performance include, [30] : a). Predictive analysis: AI can assist in the recruitment process more effectively and efficiently by processing and analyzing candidate data. b). Measurement and feedback: AI systems can analyze performance data, monitor progress, and provide suggestions for employee development, c). c). Reducing employee workload: AI can perform heavy and time-consuming tasks such as scheduling interviews, processing data, and even conducting interviews, [31] d). Understanding employee needs: AI's analytical capabilities can improve employee job satisfaction by understanding their needs and preferences, [31] and e). Automation of routine tasks: AI can be used to automate routine tasks in the public sector, such as financial supervision, submissions, and assignments, [32]. Many factors influence employee performance concerning the implementation of AI, including skills and abilities, learning and innovations, leadership style, organizational culture, work environment, loyalty, commitment, and work discipline, [33]. Among these factors, the ones that make employee performance more optimal in the context of HR practices and the implementation of technology or AI are skills and abilities, learning and innovations, and organizational culture.

Based on theoretical studies, research hypotheses can be formulated as follows :

a) There is a significant difference in the influence of HRM practices in recruitment and selection on HRM performance between those implementing AI and those not implementing AI.

b) There is a significant difference in the influence of HRM practices in development and training on HRM performance between those

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implementing AI and those not implementing AI.

There is a significant difference in the influence of HRM practices in performance management on HRM performance between those implementing AI and those not implementing AI.

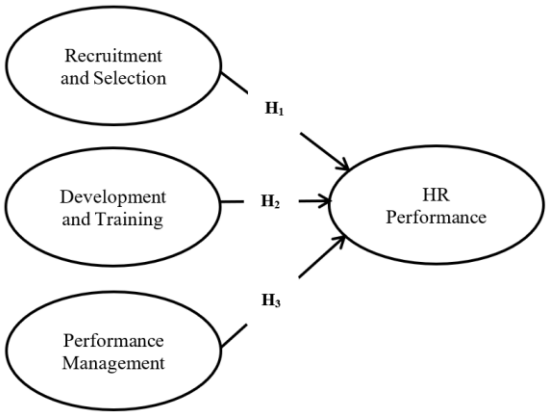

Figure 1. Conceptual Framework

RESULT

The theme of this research is Comparative Study: Implementation of Artificial Intelligence in Human Resource Management on Employee Performance, a case study comparing organizations that implement AI with those that do not implement AI in HRM management or practices. The research population consists of organizations in the city of Padang, with the professional sample determination technique using probability sampling. The selection of organizations is done randomly, meeting both conditions: organizations implementing AI and organizations not implementing AI in HRM management or practices. Based on the sample size, there are 14 organizations implementing AI with a total of 28 respondents and 33 organizations not implementing AI with a total of 55 respondents. The research model is a Structural Equation Modeling (SEM) with analysis tools using Smartpls 3.29. There will be two tests: the outer model, which involves measurements related to validity and reliability, and the inner model test to examine the research hypotheses.

The results of the assessment of the characteristics of the research respondents can be seen in Table 1.

No	Description	Frequency	Percentage (%)
A.	**Organizational**		
	Doesn't Use AI	55	66.3
	Using AI	28	33.7
	Total	83	100.0
B.	**Gender**		
	Woman	36	43.4
	Man	47	56.6
	Total	83	100.0
C.	**Age**		
	21-30 Year	12	14.5
	31-40 Year	38	45.8
	41-50 Year	22	26.5
	>50 Year	11	13.3
	Total	83	100.0
D.	**Education**		
	High School/Equivalent	2	2.4
	Diploma	1	1.2
	Bachelor	25	30.1
	Masters	48	57.8
	Doctor	7	8.4
	Total	83	100.0
E.	**Period of Work**		
	< 1 Year	5	6.0
	1-10 Year	44	53.0
	11-20 Year	21	25.3
	> 20 Year	13	15.7
	Total	83	100.0

Table 1. Respondent Characteristics

The results of the frequency distribution test in the study explain that out of the 83 respondents sampled in this research,

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66.3% have not implemented AI in their HRM management, while the remaining 33.7% have implemented AI in their HRM management. Furthermore, out of the 83 organizations sampled in this research, 43.4% are female, and the remaining 56.6% are male. The maximum age level ranges between 21-40 years, accounting for 45.8%, and the respondents' education level is predominantly at the Master's level, accounting for 57.8%. The employees' work experience ranges from 1 to 10 years, accounting for 25.3%.

Next, the results of the Smartpls 3.29 test in the Outer model stage, related to the testing of instruments for each variable from Smartpls 3.29, can be seen in Table 2.

	HR Performance	Work management	Development and Training	Recruitment and Selection
HRP1	0,926			
HRP2	0,842			
HRP3	0,860			
WMG1		0,936		
WMG2		0,921		
WMG3		0,933		
DAT1			0,864	
DAT2			0,850	
DAT3			0,844	
RAS1				0,883
RAS2				0,932
RAS3				0,894

Source: Prepared by the authors (2023)

Table 2. *Construct Validity*

The results of the model testing in Table 2 indicate that all outer loading values from the validity aspect, for all indicators forming the research variables including Human Resource Performance, Recruitment and Selection, Development and Training, and Performance Management, have values above 0.7, meeting the criteria for declaring an indicator valid. Furthermore, reliability testing to assess the level of consistency or reliability of respondent answers can be presented in Table 3.

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
HR Performance	0,849	0,909	0,769
Recruitment and Selection	0,887	0,930	0,815
Development and Training	0,815	0,889	0,727
Work Management	0,922	0,951	0,865
R Square		0,700	
R Square Adjusted		0,682	

Source: Prepared by the authors (2023)

Table 3. Construct Reliability

From Table 3, overall, the reliability level of the research variables is robust, with Cronbach's alpha and composite reliability values all exceeding 0.7. In other words, the validity and reliability levels of the researched model have been met, supported by the Average Variance Extracted (AVE) values, which are consistently above 0.5 for all research variables. Meanwhile, the R-square and R-square Adjusted values indicate a significant contribution of the three exogenous variables in explaining the endogenous variable, with values exceeding 50%. In other words, the model can be considered well-measured or appropriate in addressing the existing research hypotheses.

With the completion of the outer model tests for all research variables, the next examination is the Inner model. This

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testing is related to the testing of research hypotheses, and the summary of the inner model results is presented in Table 4.

Hypo	Description	Doesn't Use AI		Using AI		Multi Grup Analysis	
		Original Sample (O)	P - Value	Original Sample (O)	P - Value	Path Coefficients - diff	p-Value
1	There is an influence of HR practices in recruitment and selection on HR performance	0,436	0,026	0,034	0,905	0,403	0,119
2	There is an influence of HR practices in development and training on HR performance	0,252	0,172	0,383	0,129	-0,131	0,684
3	There is an influence of HR practices in performance management on HR performance	0,307	0,087	0,472	0,005	-0,166	0,750

Source: Prepared by the authors (2023)

Tabel 4. Result For Inner Weights & Multi Group Analysis

The Impact Difference of HR Practices in Recruitment and Selection on HR Performance between AI-Applying and Non-AI-Applying Organizations

The Smartpls summary results in Table 4 indicate that in organizations not implementing artificial intelligence (AI), there is a significant influence of HR practices in recruitment and selection on HR performance with a low P-value of 0.05 or 0.02 < 0.05. Meanwhile, for organizations that have implemented artificial intelligence (AI), there is no significant influence of HR practices in recruitment and selection on HR performance because the P-value is > 0.05 or 0.905 > 0.05. These findings explain the presence of AI in HR practices for organizations that have not implemented AI, indicating a belief that assessing employee performance through manual recruitment and selection remains a valid assessment method for obtaining quality new candidates that determine the level of performance they will generate.

In contrast, for organizations that have implemented AI in HR practices related to recruiting and selecting new employees, there is no empirical evidence that the use of AI in the recruitment and selection process is well-measured in assessing HR performance. This occurs because AI implementation is not yet running smoothly with adequate HR support. Additionally, HR personnel with better integration capabilities with technology and AI are needed. These findings support previous research stating that the use of AI can help find the right HR quality according to the organization's needs more efficiently, [1], [21], [34], [35]. In other words, AI helps organizations collect initial data from candidates, communicate, and get an overview of potential candidates for the position.

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Furthermore, to assess the hypothesis comparison between organizations applying AI and those not applying AI in HR practices in recruiting and selecting new employees related to HR performance, it is found that there is no significant difference in influence in both types of organizations. This is because the P-value is large, 0.05 or 0.119 > 0.05, leading to the rejection of the hypothesis. This finding also indicates that the application of AI in both organizations, especially in the West Sumatra region and its surroundings, is still relatively limited. This is due to the quality of HR personnel that need to be prepared to meet the skills and adaptability required for technology and AI implementation. It is also related to equipment and supporting facilities in the implementation of technology and AI, [36]. Although AI integration is currently mostly related to recruitment practices, it can be applied in every aspect of HR through chatbots and AI-based applications.

The Difference in the Impact of HR Practices in Development and Training on HR Performance between AI-Applying and Non-AI-Applying Organizations

The results of the Smartpls test in Table 4 conclude that organizations, whether applying artificial intelligence (AI) or not, do not show that HR practices in development and training have a significant influence on HR performance. The P-value is large, exceeding 0.05. This outcome indicates that both AI-based and non-AI-based development and training in HR management have not proven to enhance HR performance. This is reflected in both organizations studied, suggesting that the impact of development and training cannot be directly measured in the improvement of HR or employee performance. Furthermore, the results of the multi-group analysis (MGA) also indicate that there is no significant difference between organizations applying AI and those not applying AI in HR practices related to the development and training of HR for HR performance. The P-value is large, exceeding 0.05 or 5%, leading to the rejection of the hypothesis. These findings indicate that the development and training conducted for employees do not have a direct impact on improving HR performance. This condition may be related to internal factors within HR, where the quality of HR with an educational background that does not match their managed field or the support facilities for work has caused difficulties in development and training, and its impact on the achievement of HR performance is also not optimal. Currently, artificial intelligence or AI has a significant impact on changing the traditional way companies recruit, train, and develop individuals within the organization. AI transforms how companies manage the workforce and formulate plans to improve overall employee productivity and engagement, [37], [38]. Research related to this issue states that AI has a positive impact on employee management in companies and recommends investing more in AI processes to leverage human resources in organizational activities, [38]. Furthermore, other research results state that AI has had a significant impact on human resource management, particularly in terms of recruitment, training, development, and employee retention in the workplace, [39].

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AI-enhanced learning systems can offer training programs tailored to individual employee performance. This is likely to facilitate a significant increase in workforce productivity because AI learning systems can act as personal tutors for employees, assisting in developing their potential and capabilities, [40], [41]

The Difference in the Influence of HR Practices in Performance Management on Employee Performance between those Implementing AI and those Not Implementing AI.

The results of SmartPLS testing in Table 4 conclude that organizations implementing artificial intelligence (AI) demonstrate that HR practices in performance management significantly affect employee performance. The P-value, with a value greater than 0.05 or 0.005 < 0.05, indicates statistical significance. On the other hand, organizations not implementing AI in HR practices related to performance management do not show a statistically significant impact on employee performance, with a P-value of 0.087, which is higher than 0.05.

These findings inform us that, in terms of influence, HR practices in performance management with the assistance of AI prove to enhance and optimize employee performance. AI is capable of providing more accurate information on all employee activities and achievements, comparing them with set targets or plans. This can be done at the individual, unit, or departmental levels, proving valuable for leaders and management in evaluating the performance of each employee, unit, or department and contributing to employee career development. Simultaneously, it provides information related to risks, aiding leaders and management in preventing setbacks or financial risks that may impact the organization's operations in the future, [37].

Meanwhile, the results of the Multi-Group Analysis (MGA) reveal that there is no significant difference between organizations implementing AI and those not implementing AI in HR practices related to performance management and its impact on employee performance. The P-value, which is greater than 0.05 (0.75 > 0.05), leads to the rejection of the hypothesis.

This finding also concludes that HR performance management for both organizations, whether implementing AI or not, is proven to have no differences in its administration. Generally, the form of HR performance management is relatively similar, but with the use of AI, all performance management practices become much easier to handle efficiently and effectively. This finding suggests that the majority of organizations still do not implement AI in HR management activities, and if they do, it may only be for HR practices on a relatively small scale.

It is stated that managing employee performance using AI has the potential to have a positive impact on development, retention, and productivity, [42]. Furthermore, it can be argued that the benefits a company will gain through the implementation of artificial intelligence (AI) in HR operations include, [32]: a) a 0.8% – 1.4% annual increase in HR productivity, b) AI assists HR in handling administrative tasks that previously consumed nearly 50% of HR time and effort, c) improved HR performance, and d) AI helps HR enhance the quality,

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effectiveness, and efficiency of work, as well as eliminate errors typically caused by humans.

CONCLUSION

The findings of this research conclude that, in general, human resource (HR) practices related to recruitment and selection, development and training, as well as performance management, do not exhibit significant differences in the performance of HR between organizations or institutions, whether implementing artificial intelligence (AI) or not. However, when examining the influence among HR practice variables, some variables have a significant impact, such as performance management showing a significant influence on HR performance in organizations implementing AI. In contrast, in organizations not implementing AI, there is only a significant influence of recruitment and selection on HR performance.

Based on these findings, it can be generalized that overall, the adoption of AI in the West Sumatra region and its surrounding areas is still relatively low, and conventional approaches are still prevalent in managing HR practices. This is attributed to the inadequate readiness for technology adoption and matters related to artificial intelligence (AI), alongside the need for supporting facilities and infrastructure. Therefore, in the future, this should be a concern for organizations to develop the skills and capabilities of HR to adapt and integrate with the ongoing technological advancements and AI developments.

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