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Design of Recruitment Vendor Selection System to Meet the Needs of it Resources at Startup Company PT XYZ

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ABSTRACT

In the era of globalization, competition among companies in providing goods and services has become increasingly intense, making organizational success highly dependent on competent human resources. Technology-based startups in Indonesia face challenges in acquiring high-quality IT personnel, leading many to adopt outsourcing as a recruitment solution. PT XYZ, a logistics startup that relies on technology and mobile applications, collaborates with outsourcing vendors to meet its IT workforce needs. However, PT XYZ faces difficulties in selecting high-performing vendors due to the absence of an objective and structured selection system. This study aimed to evaluate the reliability of PT XYZ's vendor recruitment assessment system, analyze the criteria and weights used in selecting recruitment vendors, and design a more objective and accurate vendor selection system. The research employs a mixed-method approach, incorporating descriptive analysis and the Analytical Hierarchy Process (AHP) to determine vendor criteria weights, as well as MPE analysis to design the system. The findings indicated that PT XYZ's current vendor assessment system is unreliable, with an average evaluation score of 1.9. The key criteria for vendor selection included integrity (0.157), cooperation (0.094), quality (0.235), timeliness (0.219), cost (0.244), and resource utilization (0.05). Based on the analysis, this study proposes a more effective vendor recruitment selection system to enhance PT XYZ's efficiency and competitiveness in acquiring IT personnel that align with the company's needs.

Introduction

In the era of globalization, competition between companies as providers of goods and services is increasingly tight (Ameliola & Nugraha, 2013). The company competes in providing high-quality services and products, so that the company gains profits with the increase in customers. As business competition develops, competent human resources are needed as the driving force of the organization (Kadarisman, 2017; Mialiawati, 2020; Sari et al., 2024; Skare et al., 2021). Human resources are the only resources that have

feelings, desires, skills, knowledge, motivations, power and works (ratio, taste and karsa). All of these human resource potentials affect the organization's efforts to achieve goals. The more advanced technology, the development of information, and the availability of adequate capital and materials, without human resources, it is difficult for organizations to achieve their goals (Ikah, 2022; Ishak, 2017; Maesyaroh, 2020; Ramaquita Andry, 2020).

Technology at this time is indispensable in carrying out corporate activities in the modern and digital era, including startup companies. Indonesia has 2,492 startups as of May 10, 2023. That number is the sixth largest in the world. A startup company is a company that is still in the process of development and is basically synonymous with companies that utilize the internet and technology (Darwis, 2019; Gerhart J. R.; Noe R. A.; Wright P. M., 2010). The goal of a startup company is to fix the shortcomings of existing products or create completely new products. Startup companies generally need large capital to run their business, but the income obtained is still relatively limited. So that the presence of venture capital is needed and able to become a job with great opportunities to learn and innovate, because companies will lag behind other companies' competitors if they do not involve technology. The high need for technology in a startup requires qualified human resources in the field of science and technology (IT). Most startups need human resources in the field of Information Technology (IT). The need for IT human resources in startups is also large (Budiawan Rachmawati Susan; Erawati Wati; Fibriani Firstianty Wahyuening, 2022; Cooper P. S., 2014; Creswell, 2010). This is because IT is a key element in startup success. A well-trained and experienced IT team is needed to develop technology products and services, design and manage complex IT infrastructure, process data to support business decisions, maintain information security, and address users' technical needs. In addition, the IT team assists in the development of scalable products and efficient operations. In a fast-paced and competitive startup world, the presence of a strong IT team is key to innovating, growing, and competing in the market. In the recruitment process, the human resources division must be thorough and selective, in selecting employees of the IT division who have knowledge and skills and have qualified experience in the field of technology. Currently, the number of human resources in the IT field is very limited because the conditions of needs are not in accordance with the demand from employers. So the human resources division needs the right strategy in the recruitment process to meet the needs of IT employees, one of which is by using recruitment or outsourcing vendors (Afifah & Setyantoro, 2021; Iswahyudi et al., 2023; Wulandari, 2014; Zakwan et al., 2014).

Outsourcing is an effort to contract an activity or company activity to an external party. The main purpose of outsourcing is the fulfillment of the company's desire to concentrate on the main business. Outsourcing can be interpreted as an effort to increase the efficiency of the company by utilizing external resources to replace resources from within the company in completing certain tasks that have been considered less efficient. There are two types of outsourcing vendors (Faizah & Suib, 2019; Pratiwi & Hartini, 2023; Rerung, 2018). First, the employer vendor. This vendor contracts with candidates who will later place their workers in the Company that uses their services. Second, the recruitment facilitator vendor, where this vendor does not give contracts to candidates. Candidates who are successfully recruited or obtained from recruitment services will work and be contracted by companies that use recruitment services (Saefuloh, 2011).

Using vendor outsourcing in the IT human resources (HR) hiring process has a number of significant benefits for companies. One of the advantages is the special

expertise that outsourcing vendors have in recruiting IT experts. With a deep understanding of the needs of the industry and the IT labor market, they can search and assess candidates efficiently. Additionally, outsourcing vendors have access to a wide network of IT professionals looking for jobs or contracts, expanding the scope of the search and increasing the chances of finding the right candidate. Therefore, the term outsourcing is closely related to company restructuring which is an effort to improve the company's structure in order to be able to produce more effective and efficient performance so that the company is able to achieve competitive advantage in the business field that is its core business. In hiring outsourced employees, it is necessary to pay attention to the capabilities of human resources because it is an important production factor in determining the development of an organization. This happens because all organizational activities will be carried out by employees as human resources. Thus, it can be said that the results of achieving organizational goals can be determined by the effectiveness of the recruitment process.

The outsourcing work system is to transfer business activities to a third party. The company hands over to the worker service provider (vendor) to carry out the business activities or recruitment process, then the company obtains human resources to do work in the company. By using this system, companies can save production costs because in their implementation it is handed over to vendors. Companies are more efficient in time and labor because they do not need to pay attention to career paths, leave rights, severance pay, retirement rights, and employee behavior issues. Another use is that the company's control span is not too long and the company can focus more on aspects of the company's strategy, especially on efforts to improve the company's business performance. Pros and cons still occur in society regarding the outsourcing system. The government considers that the contract and outsourcing work system can reduce the unemployment rate that occurs, in fact the use of the contract and outsourcing system experiences several problems that can harm employees. The outsourcing system blends industrial relations, especially the unclear status and the occurrence of throwing hands between distribution agencies and companies that use labor services. However, entrepreneurs still prioritize work effectiveness and efficiency to meet the increasingly fierce competition in various business fields, "manpower services or outsourcing" cannot be separated because it has become a strategic tool of company management for competition in an increasingly tight business because outsourcing is part of the management in running the business to achieve the company's goals. The recruitment and selection process can be carried out independently by the institution concerned. Although, the institution can use the services of a third party, namely a recruitment service provider company where the use of these services still follows the procedure for selecting the right employees in their field. Finding the right candidates in the recruitment process is not an easy matter if the startup company does not have a dedicated recruitment team that will handle various recruitment processes. Startup companies often need rapid growth, recruitment vendors can provide efficient solutions. The use of recruitment services is an option to help and support companies in finding the most suitable candidates for vacant positions.

The research that will be carried out is a case study on a company of one of the startups in the logistics sector. PT XYZ provides logistics services that span throughout Indonesia with the support of a complete ecosystem, offering integrated logistics services using innovative technology and mobile applications. With a primary focus on an efficient and reliable user experience, PT XYZ utilizes a work system that combines technology and mobile applications in every aspect of its operations. Through the user-friendly

mobile app, customers can easily track their shipments, monitor the status of shipments in real-time, and even set up reshipments with a few taps on their phone screens. This system is designed to provide convenience and convenience to customers, ensuring that shipments reach their destinations on time and in good condition. IT resources at PT XYZ are involved in mobile application development, maintenance of technology infrastructure, data analysis, information security, and other technical problem solving. So, to maintain efficient and reliable operations, as well as to continue to innovate in the use of technology, PT XYZ needs a lot of competent and experienced IT resources. The need for a lot of IT resources made PT XYZ decide to work with an outsourcing vendor so that PT XYZ's needs can be met quickly and efficiently. PT XYZ Company faces problems in meeting the needs of its IT workforce due to a lack of resources and time required to conduct recruitment internally. PT XYZ does not have a large recruitment team so the process needs to be assisted by a third party. These vendors have an extensive network, expertise in finding qualified IT candidates, and can simplify the selection process. By relying on recruitment vendors, PT XYZ can save its time, effort, and internal resources, so that it can focus on developing its core business within PT XYZ without sacrificing the quality of human resources they need.

In initiating the human resource recruitment process, especially in the startup company environment PT XYZ which focuses on logistics and technology services, it starts with the identification of specific human resource needs, especially in the IT field. A detailed and clear job profile is prepared for each position to be filled, including the job description, required qualifications, and the company's expectations for potential employees. After that, the company determines a recruitment vendor according to the company's internal considerations. The creation of a clear cooperation agreement between the company and the vendor is the next step, which includes aspects such as recruitment targets, service costs, and the duration of the cooperation. The process of implementing the cooperation system is then carried out, ensuring that the entire recruitment process follows the standards and procedures that have been set. Monitoring and evaluation are carried out periodically to ensure that the performance of the vendor meets the recruitment targets efficiently. The parameters of vendor performance evaluation at PT XYZ are carried out by looking at several points such as the legality of the vendor company, the administrative process, the timeliness of work, and the ease of communication with vendors. By engaging recruitment vendors, PT XYZ can leverage their specialized expertise in recruiting IT resources, expanding search reach, and increasing the chances of finding candidates who fit the company's needs, while maintaining efficiency, quality, and responsiveness in the process. The vendors used by PT XYZ are recruitment vendors that focus on finding employees for PT XYZ's company. They act as intermediaries between the company and potential employees.

Data obtained by the researcher shows that PT XYZ has collaborated with several vendors, including BATM, BOSSHIRE, EKRUT, EKSAD, GLINTS, INDOCYBER, REERACOEN, INFOTECH, XSIS, and HIRE VENDOR. This vendor carries out activities such as job vacancy announcements, selection, and placement of employees in accordance with the company's needs. So, in this case, the recruitment vendor does not provide outsourcing that involves vendor employees to work directly at PT XYZ's company. Instead, they assist the company in the recruitment process to find candidates who fit PT XYZ's human resource needs. Once an employee is hired, the employee becomes part of PT XYZ's company and works directly within it, not as an employee or

human resource provided by the vendor. The following is the data on the achievements of the vendors above during 2022-2023:

Table 1. Vendor Achievement Data

Company	Req MP	Fulfillment Vendor 2022				TOTAL Hired
		BATM	EXAMS	INDOCYBER	GLINTS	
PT XYZ	2	9	20	30	15	74

Req MP	Fulfillment Vendor 2023									TOTAL Hired
	BATM	BOSSHIRE	EKRUT	EXAMS	GLINTS	INDOCYBER	REERACOEN	SHELL INFOTECH	XSIS	
8	1	1	3	4	3	17	1	1	1	42

Source: Researcher Data (2024)

The table above illustrates the achievements of IT resource recruitment by PT XYZ in 2022 and 2023. In 2022, PT XYZ managed to recruit 74 IT resources out of a target of 92 involving 4 vendors, reaching a percentage of 80.4% of the target. However, in 2023, in collaboration with 9 vendors, PT XYZ was only able to recruit 42 IT resources out of the target of 69, showing a significant decrease in achievement. The percentage of achievement in 2023 fell to 61.8% of the target, while the number of vendors increased. This change raises questions about the effectiveness of vendor additions and the factors causing the decline in achievement. The big difference in achieving the target by the vendors above is a problem for PT XYZ. PT XYZ should be able to minimize the use of vendors whose performance is far below the target. This happens because until now PT XYZ has not conducted a survey of the vendors to be used. The selection of vendors is only based on PT XYZ's close relationship with vendors. PT XYZ does not have a qualified recruitment vendor selection system design. In fulfilling the needs of IT resources in startup companies, PT XYZ must focus on efficiency, quality, and responsiveness to company needs. Therefore, system design is very important to consider aspects such as requirements specifications, selection criteria, vendor performance measurement, cost management, and integration with the company culture. With a good selection system design, companies can make wiser and more efficient decisions when it comes to choosing an IT resource recruitment vendor. This system will allow companies to evaluate vendors based on the quality of the candidates they offer, the time it takes to hire, cost, and other relevant factors. In this way, companies can maximize the potential of each vendor, meeting the needs of IT resources efficiently.

Previous research by Syahputra and Prasetyo (2020) examined the effectiveness of recruitment strategies using external vendors and found that proper vendor selection significantly affects recruitment outcomes, especially in the technology sector. Meanwhile, Fitriani and Santoso (2020) explored how startups leverage recruitment outsourcing to address the shortage of qualified tech talent, concluding that startups benefit from vendor networks but struggle with performance consistency. This study offers a novel contribution by designing a vendor selection system tailored for IT recruitment in startups, using a case study from PT XYZ. Unlike prior research that focuses only on outcomes or challenges, this study proposes a structured vendor selection framework to evaluate vendor performance in alignment with startup scalability, quality

needs, and responsiveness—elements that have not been comprehensively addressed in previous literature.

This study aims to develop a system design for selecting IT recruitment vendors in startup companies, with a specific case study of PT XYZ. It seeks to identify performance gaps among vendors, analyze contributing factors to recruitment underperformance, and propose a vendor selection model that improves hiring efficiency, quality, and responsiveness to company needs.

This research is expected to provide practical and theoretical contributions. Practically, it enables PT XYZ and similar startups to optimize recruitment vendor partnerships through a structured selection system. It helps reduce cost inefficiency and improve IT talent acquisition outcomes. Theoretically, this study enriches the literature on human resource management in startups, particularly on third-party recruitment vendor management in the context of digital industries and high-growth organizations.

Research methods

The research method used in this study is a mixed method (quantitative and qualitative) with a qualitative research approach that aims to develop a good understanding of the problems that exist in the description of the data and existing conditions. In this type of research, the author's involvement will have a significant impact on the research. A qualitative approach is an investigative process to understand a problem of phenomena that occur based on the creation of a holistic picture formed with words, and arranged in a scientific setting (Creswell, 2010). The author will compile a number of questions and answers from these questions to provide an overview of the phenomenon regarding the research subject. The types of research questions include what, who, why, how, and when to find out the relationship between several variables (Cooper & Schindler, 2014).

In the descriptive method, the researcher can compare certain phenomena so that it is a comparative study. In accordance with the research objectives described at the beginning, one of them is to compare the presence of one or more variables on two or more different samples, or at different times. Because the author will later use the Qualitative research method, the questionnaire that will be distributed to the respondents is an open questionnaire so that the researcher will interpret the range of answers that are very different from each respondent. So that the author will later compile clear and structured questions in the research, the author hopes to understand the situation that occurs and reveal the meaning that exists in the company.

This research is included in systems research. The goal of systems research is to improve understanding of system complexity and provide better solutions through effective system design and development (Kristanto, 2018). Systems research is often applied in the context of information system design and development, organizational management, or business processes.

In this study, the objects chosen by the researcher were Indocyber recruitment vendors, Bumi Amartha Teknologi, and Eksad The selection of vendors based on these three recruitment vendors are the three highest in providing their labor to PT XYZ. The research time will be taken from November to December 2023.

The analysis techniques used in this study are descriptive through tables, graphs, and diagrams. In addition to descriptive statistics, it also uses inferential statistics by testing population and sample parameters to make conclusions that apply to the population or

sample taken. The method used is the AHP Analysis method using Software Expert Choice.

Results and Discussion

Descriptive Analysis

This research began by interviewing PT XYZ's internal recruitment division regarding the recruitment vendor assessment system that has been implemented. Then the researcher distributed a questionnaire for the selection of recruitment vendor criteria. The results of the selected criteria questionnaire then the researcher distributed a questionnaire regarding the pairing comparison of each criterion to 5 internal recruitment teams of PT XYZ, Expert, and Expert. The next stage is to find the weight value using the AHP method with the help of Software Expert Choice. The last stage of the MPE method was used to design a system for the assessment and selection of PT XYZ recruitment vendors.

1) Description of the Vendor Valuation System at PT XYZ

The research that will be carried out is a case study on a company of one of the startups in the logistics sector. PT XYZ provides logistics services that span throughout Indonesia with the support of a complete ecosystem, offering integrated logistics services using innovative technology and mobile applications. With a primary focus on an efficient and reliable user experience, PT XYZ utilizes a work system that combines technology and mobile applications in every aspect of its operations. Through the user-friendly mobile app, customers can easily track their shipments, monitor the status of shipments in real-time, and even set up reshipments with a few taps on their phone screens. This system is designed to provide convenience and convenience to customers, ensuring that shipments reach their destinations on time and in good condition. IT resources at PT XYZ are involved in mobile application development, maintenance of technology infrastructure, data analysis, information security, and other technical problem solving. So, to maintain efficient and reliable operations, as well as to continue to innovate in the use of technology, PT XYZ needs a lot of competent and experienced IT resources. The need for a lot of IT resources made PT XYZ decide to work with an outsourcing vendor so that PT XYZ's needs can be met quickly and efficiently. PT XYZ Company faces problems in meeting the needs of its IT workforce due to a lack of resources and time required to conduct recruitment internally. PT XYZ does not have a large recruitment team so the process needs to be assisted by a third party. These vendors have an extensive network, expertise in finding qualified IT candidates, and can simplify the selection process. By relying on recruitment vendors, PT XYZ can save its time, effort, and internal resources, so that it can focus on developing its core business within PT XYZ without sacrificing the quality of human resources they need. The vendor selection process is carried out internally by PT XYZ. The researcher made observations about the vendor selection system that has been used by PT XYZ. The researcher conducted interviews with 7 PT XYZ recruitment teams. The data of the resource persons can be seen in the following table:

Table 2. Respondent Data

No.	Name	Position
1.	Angela Paramitha Sasongko	*Head of Recruitment & Culture PT. XYZ*
2.	Ervinni Engwin	*SPV Recruitment PT. XYZ*
3.	Devina Yurinta	*Recruitment Officer PT. XYZ*

No.	Name	Position
4.	Rahma Neya	*Recruitment KJ 3 - UP Staff*
5.	Nindita Naura Ramadhani	*Recruitment KJ 3 - UP Staff*
6.	Annisa Sinar Fitria	*Dept. Head Recruitment PT. Propane (External)*
7.	Enjang Permai	*HR & GA Section Head PT. Kinarya Tunas Artha (External)*

At this stage, the researcher delved deeper into the vendor selection system at PT XYZ before the implementation of the design from the results of the study conducted by the researcher. Based on the results of interviews with five resource persons involved in the vendor assessment system at PT XYZ, the vendor assessment process was carried out manually. The first stage of PT XYZ's internal recruitment team determines criteria that are adjusted to the company's needs. The selection of these criteria was carried out by involving an agreement or the results of the FGD of PT XYZ's internal recruitment team. The company considers the specific needs of each division, as well as adjusts to the needs of the required skill set. In addition, experience, speed of service, area distribution, and cost are also determining factors in choosing a vendor. PT XYZ considers the experience of vendors in providing recruitment services. The experience possessed by the vendor can demonstrate their ability to address various challenges and needs that may arise during the recruitment process. PT XYZ assesses this experience based on referrals from other companies that have used the services of the vendor to be selected.

The ability of vendors to provide services quickly and responsively is critical to PT XYZ, especially when the company needs manpower urgently. Vendors who are able to provide a quick and efficient response can help companies better address recruitment needs. Distribution of reference areas to the extent to which the vendor has reach or scope in reaching potential candidates. If vendors have a wide reach, they can expand the candidate base they can access, allowing PT XYZ to have access to more diverse and qualified talent. The cost aspect is an important consideration in choosing a vendor. PT XYZ ensures that the fees offered by vendors are balanced with the quality of services provided. The company considers the balance between the added value provided by the vendor and the costs to be incurred. After the criteria are met, PT XYZ will check the legality of the vendor company before entering into a cooperation agreement. PT XYZ ensures that the selected recruitment vendor has all the company's documents and legalities that are complete and in accordance with applicable regulations. This includes employment agreements, service agreements, and other documents necessary to carry out business activities legally and reliably. The following is a list of recruitment vendors who have collaborated with PT XYZ.

Table 3. Vendor Date 2023

No.	Vendor Name
1.	Indocyber
2.	Earth Amartha Technology
3.	EXAMS
4.	Bosshire
5.	Ekrut
6.	Glints
7.	Reeracoen
8.	Shell Infotech
9.	XSIS

Source: Researcher Data (2024)

After the above things are fulfilled by the vendor, PT XYZ collaborates with the vendor to fulfill the manpower needed by PT XYZ Company. During the ongoing cooperation, internal parties periodically monitor the performance produced by the selected vendors. PT XYZ assesses the quality and speed of vendors in meeting the company's workforce needs. Vendors must be able to provide qualified candidates in accordance with the requirements set by the company. In addition, the vendor's ability to respond quickly to a company's request is also an important consideration. Human resources who have been selected with the help of this vendor will then carry out a process of measuring the quality of employees recruited by vendors by PT XYZ's internal parties with a comprehensive series of methods including technical tests relevant to the position needed by the company, interviews to evaluate the abilities and experience of prospective employees, as well as psychological tests to assess aspects of personality and cultural fit of the company.

Effective communication between PT XYZ and recruitment vendors is essential in ensuring a smooth recruitment process. PT XYZ assesses how good the vendor is in establishing open, transparent, and responsive communication with the company. Good communication can minimize misunderstandings and speed up problem resolution. The administrative aspect is included in the vendor performance assessment. PT XYZ ensures that the administrative process, such as providing quotations, sending invoices, and managing other documents, is carried out in a timely and accurate manner. If the needs have been met, PT XYZ conducts an internal evaluation of the performance of the vendors used. Vendor evaluation includes several aspects, namely Legality, Administration, Technical Evaluation (Vendor PIC Performance, Timeliness, and Communication). Evaluations were determined using a scale of 1-5. If the final result of the vendor's performance is below 3, the vendor is not recommended for reuse. The following is data from the performance assessment of one of the recruitment vendors that has been used by PT XYZ.

VENDOR IT PERFORMANCE EVALUATION
HUMAN CAPITAL DIVISION
PERIODE TAHUN 2022

A. Data Vendor dan Kontrak Pekerjaan

1. Nama Vendor	**PT Aku Mitra Digital Indonesia**
2. Jenis penyediaan barang/ jasa (Nama Proyek)	**Jasa Rekrutmen IT Outsource**

Skor Penilaian *Tulis angka penilaian di kolom "kriteria"*	Buruk *Poor*	Perlu Perbaikan	cukup/ *Fair*	Bagus/ *Good*	Istimewa/ *Excellent*
	1	2	3	4	5

B. Kriteria Evaluasi Umum		**Bobot**	**Skor Penilaian**	
			Kriteria	Skor
1	Legalitas Perusahaan	30%	4	1,2
2	Administrasi : Quotation, PO, Invoice, dll	20%	1,5	0,3
C. Evaluasi Spesifikasi Teknis		**Bobot**	**Skor Penilaian**	
			Kriteria	Skor
1	PIC dedicated	20%	2	0,4
2	Ketepatan Waktu Pekerjaan/Proyek/Pengiriman	20%	2	0,4
3	Kemudahan komunikasi dengan vendor (Koordinasi kerja dengan user)	10%	1	0,1

Total Skor **2,4** **Tidak Direkomendasikan**

Rekomendasi / Catatan Khusus :
1. Mampu menyelaraskan kebutuhan Anteraja
2. Mampu mempertanggung jawabkan komitmen yang sudah di sepakati terkait hak dari Resource

Figure 1. Vendor Performance Evaluation
Source: Research Data (2024)

The problems faced by PT XYZ are related to the absence of a clear and structured system design. The following are the results of a questionnaire regarding the reliability of the vendor selection system at PT XYZ using the Likert scale:

Table 4. Data from the Reliability Questionnaire of the Vendor Selection System of PT XYZ

N0.	Criterion	Average
1	**Completeness of Assessment Criteria:** "The vendor selection system includes all the relevant and important criteria for assessing vendor reliability."	2.4
2	**Assessment Objectivity:** "The vendor assessment process in this system is carried out objectively without bias."	1.4
3	**Consistency in Application:** "The vendor selection system is applied consistently to all vendors evaluated."	2.4
4	**Process Transparency:** "The process and results of vendor assessments can be accessed and clearly understood by interested parties	2.4
5	**Assessment Accuracy:** "The assessments generated by this system are accurate and reflect the actual capabilities of the vendor	1.2
6	**Use of Historical Data:** "This vendor selection system makes good use of historical data to assess vendor performance."	3.4
7	**Time Efficiency:** "The process of selecting vendors through this system is carried out efficiently without excessive time."	1.2
8	**System Flexibility:** "The system is flexible enough to tailor the assessment criteria according to the needs of a particular project or situation."	2.4
9	**Technology Usage:** "This system leverages the right technology to improve reliability and efficiency in vendor assessments."	1.2
10.	**Sustainability and Updates:** "The system is updated regularly to ensure its reliability as market conditions change."	1.2
	Average	**1.92**

Source: Data Processed, 2024

The results of the questionnaire on the reliability of PT XYZ's vendor selection system showed that the average level of importance of all criteria was at 1.92, which indicates any concern or dissatisfaction with the current system. The completeness of the assessment criteria, consistency in implementation, and transparency of the process each obtained an average score of 2.4, indicating room for improvement, even though it is considered quite relevant. However, assessment objectivity (1.4), assessment accuracy (1.2), time efficiency (1.2), technology use (1.2), and sustainability and uptime (1.2) were all underscored, signaling serious concerns about process integrity, accuracy, and speed.

The only aspect that obtained an above-average score was the use of historical data (3,4), indicating that the system is quite good at utilizing historical data to assess vendor performance. It can be concluded that the vendor appraisal system is at an unreliable level. This can lead to failure to achieve optimal performance of the selected recruitment vendors. One of the main aspects that is the cause is the lack of an objective and systematic assessment in the early stages of selecting recruitment vendors to meet the needs of the workforce in the company. Without a structured system design, PT XYZ has difficulty effectively evaluating recruitment vendors' performance.

Table 5. Vendor Achievement Data

Company	Req MP	Fulfillment Vendor 2022				TOTAL Hired
		BATM	EXAMS	INDOCYBER	GLINTS	
PT XYZ	2	9	20	30	15	74

	Req MP	Fulfillment Vendor 2023									TOTAL Hired
		BATM	BOSSHIRE	EKRUT	EXAMS	GLINTS	INDOCYBER	REERACOEN	SHELL INFOTECH	XSIS	
	8	1	1	3	4	3	17	1	1	1	42

Source: Processed Data (2024)

In 2022, PT XYZ managed to recruit 80.4% of the target IT resource needs, while in 2023, it only reached 61.8% despite increasing the number of vendors. This decline shows the ineffectiveness of the vendor addition process, which is not supported by surveys or objective assessments, but is based only on relationships. PT XYZ requires a structured vendor selection system, including needs specifications, selection criteria, performance measurement, cost management, and integration of company culture (Sadatrasoul M. R.; Siami M.; Hajimohammadi Z., 2013).

Without an objective assessment, the vendor selection process risks being less transparent and inconsistent, making it difficult for companies to evaluate the quality and suitability of vendors for long-term needs. To address this, PT XYZ must develop a clear and data-driven assessment framework, including criteria such as experience, track record, financial capabilities, and quality of service. This system will ensure more measurable decisions and support the optimal fulfillment of IT resource needs.

To remedy this problem, the researcher designed and implemented an effective assessment system. The researcher identifies the company's needs, analyzes industry trends, and considers best practices in selecting recruitment vendors. Thus, PT XYZ can ensure that the new appraisal system not only provides a clearer view of vendor performance but also becomes a solid foundation for better vendor selection decisions in the future.

2) Identify Important Criteria

The researcher conducted the first stage of distributing the questionnaire to 7 respondents. This questionnaire aims to obtain important criteria that PT XYZ will use. The following is a list of respondents:

Table 6. Responders

No.	Name	Position
1.	Angela Paramitha Sasongko (Sasongko Indah; Maharani Septya, 2017)	*Head of Recruitment & Culture PT. XYZ*
2.	Ervinni Engwin	*SPV Recruitment PT. XYZ*
3.	Devina Yurinta	*Recruitment Officer PT. XYZ*
4.	Rahma Neya	*Recruitment KJ 3 - UP Staff*
5.	Nindita Naura Ramadhani	*Recruitment KJ 3 - UP Staff*
6.	Annisa Sinar Fitria	*Dept. Head Recruitment PT. Propane (External)*
7.	Enjang Permai	*HR & GA Section Head PT. Kinarya Tunas Artha (External)*

Source: Processed Data (2024)

After getting the results of the first questionnaire, the next stage is the determination of important criteria. The determination of important criteria is carried out by looking at each criterion's average level of importance based on the opinions of respondents from internal and external companies through the first questionnaire. If the average of the criteria is less than 3, then the criteria are declared unimportant and cannot be used, and if the average of the criteria is equal to or more than 3, then the criteria are important and can be used. The average level of importance is determined with the help of the Microsoft Excel program. Table 7 shows the average level of importance of the criteria.

Table 7. Average results of the importance level of the criteria

N0.	Criterion	Importance Level					Sum	Average	Result
		1	2	3	4	5			
1	Vendor Integrity	0	0	0	1	6	34	4.8	Important
2	Vendor Cooperation	0	0	2	4	1	27	3.8	Important
3	Quality Vendor	0	0	2	2	3	29	4,1	Important
4	Accuracy of work completed on time	0	0	3	1	3	28	4	Important
5	Prices or service rates charged	0	0	3	1	3	28	4	Important
6	Compliance with K3 management	5	2	0	0	0	9	1.3	Not Important
7	Environmental management compliance	3	4	0	0	0	11	1.6	Not Important
8	Security management compliance	0	2	4	1	0	20	2.9	Not Important
9	Resource usage		1	1	5	0	25	3.5	Important

Source: Research data processed with Microsoft Excel.

The number is obtained from the results of summing the level of importance of the criteria from 7 respondents, and the average is obtained from the number divided by the number of respondents, which is 7. It can be seen from the average hail presented in Table 3.4 that there are three criteria that are declared unimportant according to the respondents. These criteria are compliance with K3 management, compliance with environmental management, and compliance with security management. Each criterion received an average score of 1.2, 1.6, and 2.9. The average result is below 3, so the three criteria are discarded and not used for weighting.

Stages of the AHP Method

The calculation process using the Analytic Hierarchy Process (AHP) method is carried out in the following stages:

1) Decomposition

Define the problem and purpose of the research. From this research, a hierarchy was obtained for problem solving. The following is the hierarchy obtained:

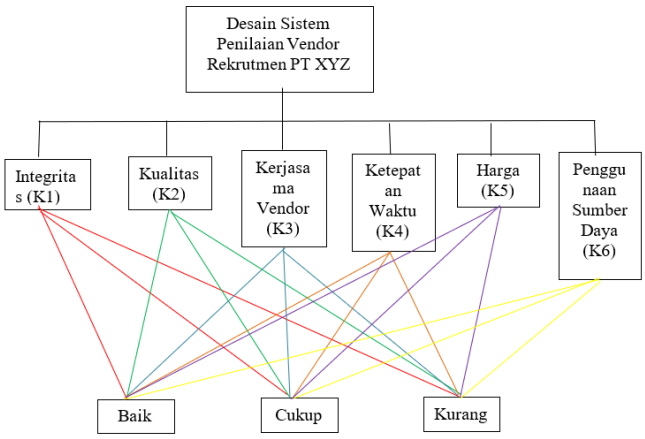

Figure 2. AHP Hierarchy of PT XYZ Vendor Assessment

The AHP method is used in this study to assist in the weighting process of criteria to assess the performance of IT Human Resource Recruitment vendors obtained from the determination of important criteria previously. Before the weighting, the hierarchy is first prepared. The hierarchy above results from a questionnaire to select important criteria from 7 respondents.

2) Determine the criteria priority

a. Criteria Priority Matrix

Paired comparison matrices are filled with numbers to represent the relative importance between the elements. 1 (equally important), 3 (slightly more important), 5 (more important), 7 (very important), 9 (very important). After the results of each respondent's questionnaire are input into Expert Choice 11, then the results of each respondent's questionnaire must be used as a single data unit to continue the calculation of AHP (Analytic Hierarcy Process) using Expert Choice 11, each comparison of the same criteria in the third result of Pairwise Comparison between criteria will be calculated as a geometric average. The following comparison matrix table is the result of accumulated data taken from 7 respondents.

Table 8. Pairwise Comparison Between Criteria (Combined)

Criterion	Integrity	Collaborate	Quality	Time	Price	Resource Usage
Integrity	1	2.28	2.12	1.43	1.43	3.02
Collaborate	0.43	1	1.92	2.63	3.59	2.74
Quality	0.47	1.00	1	1.10	1.00	3.93
Time	0.69	0.38	0.91	1	1.06	3.50
Price	0.69	0.27	1.00	0.94	1	4.84
Resource Usage	0.33	0.36	0.25	0.28	0.20	1
Sum	**3.64**	**4.82**	**7.20**	**7.3**	**8.28**	**19.03**

Source: Data Processed, 2024

b. Criterion Value Matrix/ Matrix Normalization

Matrix normalization is done by dividing each value in the column by the total column, followed by adding the value of each row and dividing it by the number of elements to get the average (Priority weight). The results of the matrix normalization are attached in the following table:

Table 9. Criterion Value Matrix (Matrix Normalization)

Criterion	Integrity	Collaborate	Quality	Time	Price	Resource Usage	Sum	Priority
Integrity	0.27	0.47	0.29	0.19	0.17	0.15	1.566	**0.157**
Collaborate	0.12	0.20	0.26	0.35	0.43	0.14	1.527	**0.094**
Quality	0.12	0.10	0.13	0.14	0.12	0.20	0.852	**0.235**
Time	0.19	0.07	0.12	0.13	0.12	0.18	0.844	**0.219**
Price	0.19	0.05	0.13	0.12	0.12	0.25	0.891	**0.244**
Resource Usage	0.09	0.07	0.03	0.03	0.02	0.05	0.318	**0.051**

Source: Data Processed, 2024

Based on the results of the normalization of the criteria value matrix in Table 9, Price ranks highest with 0.244 priority weight, indicating that price is the most important factor in decision-making. Quality and Time follow with priority weights of 0.235 and 0.219, respectively, indicating that these two factors are also significant considerations in addition to price. Integrity, while important, has a priority weight of 0.157, which puts it below price, quality, and time. Cooperation with a priority weight of 0.094 indicates that the ability to cooperate is considered less important than the other criteria. Resource usage has the lowest priority weight of 0.051, indicating that this aspect is considered the least important factor in the overall evaluation. Overall, this table illustrates that price, quality, and time are the main focuses in the assessment, while integrity, cooperation, and resource use have a smaller role.

c. Calculating the Consistency Ratio

Consistency calculation is used to determine the level of consistency of respondents' answers. If the CI value is equal to zero, then the pairwise comparison matrix is consistent. Thomas L. Saaty's limit of inconsistency is determined using the Consistency Ratio (CR), which compares the consistency index with the value of the random index (RI).

Table 10. Consistency Ratio

Criterion	***Matrix Pair-Wise***	***Matrix Priority***	λ Max = (***Matrix Pair-Wise***) * (***Matrix Priority***)
Integrity	3.6	**0.157**	0.95
Collaborate	4.8	**0.094**	1.23
Quality	7.2	**0.235**	1.02
Time	7.4	**0.219**	1.04
Price	8.3	**0.244**	1.23
Resource Usage	19.030	**0.051**	1.01
SUM			**6.5**

Source: Data Processed, 2024

$$CI = \frac{\tau \max - n}{\mathrm{n} - 1}$$
$$CI = \frac{6.5 - 6}{6 - 1}$$
$$CI = 0.09632$$
$$CR = \frac{\mathrm{C}I}{\mathrm{R}I}$$
$$CR = \frac{0.09632}{1.24}$$
$$CR = 0.077676242$$

Based on the table, the value of λ Max is calculated from the multiplication result between the paired comparison matrix and the priority matrix for each criterion. The above formula calculates the CI value, where n is the sum of the criteria. From the calculation, a CI value of 0.09632 was obtained. Furthermore, CR is calculated by dividing the CI value by the RI value, which in this case is 1.24. The calculation results showed that the CR value was 0.0777, which indicated that the level of inconsistency was within acceptable limits. With a CR of less than 0.1, it can be concluded that these pair comparisons are consistent and can be used for decision-making.

3) Determining Sub-Criteria

The calculation of the sub-criteria is almost the same as the calculation of the criteria above. After the paired comparison data (criteria) is completed in Expert Choice 11, the next step is to input factor comparison data (sub-criteria). The selected sub-criteria must meet the previously determined criteria. There are sub-criteria in PT. XYZ is in the form of Good, Sufficient, and Less categories. The results in the Expert Choice calculation are as follows:

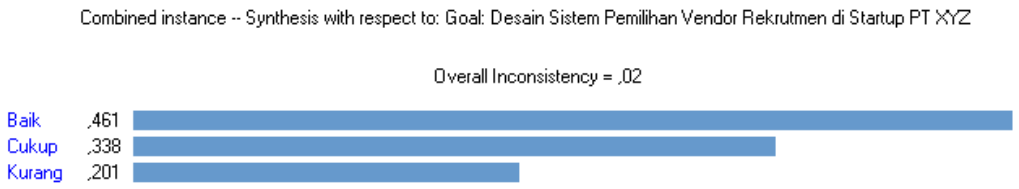

Figure 3. Sub-criterion Weighting Results

After calculating the criteria and sub-criteria, the next step is to calculate priorities. The weight priority is obtained by multiplying the weight of the criteria by the weight of the sub-criteria for each criterion and sub-criterion being assessed. The results of the Priority calculation can be seen in Table 11.

Table 11. Final Assessment Results of AHP (Analytic Hierarchy Process)

Criteria Code	Criterion	Weighting Criteria	Sub Criteria	Weight Sub Criteria	Weight Priority
			Good	0.461	0.08
			Enough	0.338	0.04
K1	Integrity	0.157	Less	0.201	0.03
			Good	0.461	0.05
K2	Collaborate	0.094	Enough	0.338	0.03

Criteria Code	Criterion	Weighting Criteria	Sub Criteria	Weight Sub Criteria	Weight Priority
			Less	0.201	0.02
			Good	0.461	0.11
			Enough	0.338	0.07
K3	Quality	0.235	Less	0.201	0.05
			Good	0.461	0.11
			Enough	0.338	0.07
K4	Time	0.219	Less	0.201	0.03
			Good	0.461	0.12
			Enough	0.338	0.09
K5	Price	0.244	Less	0.201	0.04
			Good	0.461	0.02
			Enough	0.338	0.02
K6	Resource Usage	0.05	Less	0.201	0.01

Source: Data Processed, 2024

The results of the calculation of the priority of criteria and sub-criteria, as seen in Table 3.8, provide an overview of the significance level of each element in an evaluation or decision. The criteria of Integrity, Cooperation, Quality, Time, Price, and Resource Use have been given weights that reflect the relative level of importance of each. The K3 (Quality) criterion has a fairly high weight, 0.235, and the Good sub criterion has the highest Weight Priority of 0.11. Thus, it can be interpreted that in the context of this evaluation, Quality has a significant impact, especially on the "Good" aspect. In contrast, Criterion K6 (Resource Utilization), with a weight of 0.05, showed a lower level of influence compared to the other criteria. After the priority of the criteria is determined, the next stage is the formulation of the system design using the Exponential Comparison Method (MPE).

Stages of the Exponential Comparison Method (MPE)

1) Proposed model based on Exponential Comparison (MPE)

a. Alternative Data

The preparation of the following data is the result of internal discussions with the recruitment team from PT XYZ. Objects in the form of selected vendors were used, namely 9 recruitment vendors: Indocyber, Bumi Amartha Technology, EKSAD, Bosshire, Ekrut, Glints, Reeracoen, Shell Infotech, and XSIS. The selection of vendors is based on vendors often used to provide labor to PT XYZ.

Table 12. Alternative Data

No.	Vendor Name	Criterion	Sub Criteria	Value
1.	Indocyber	Integrity	Good	3
		Collaborate	Good	3
		Quality	Good	3
		Time	Enough	2
		Price	Enough	2
		Resource Usage	Enough	2
2.	Earth Amartha Technology	Integrity	Good	3
		Collaborate	Enough	2
		Quality	Enough	2
		Time	Less	1

No.	Vendor Name	Criterion	Sub Criteria	Value
		Price	Less	1
		Resource Usage	Less	1
3.	EKSAD	Integrity	Good	3
		Collaborate	Good	3
		Quality	Enough	2
		Time	Enough	2
		Price	Enough	2
		Resource Usage	Less	1
4.	Bosshire	Integrity	Good	3
		Collaborate	Good	3
		Quality	Good	3
		Time	Good	3
		Price	Less	1
		Resource Usage	Good	3
5.	Erection	Integrity	Enough	2
		Collaborate	Enough	2
		Quality	Enough	2
		Time	Less	1
		Price	Enough	2
		Resource Usage	Enough	2
6.	Glints	Integrity	Enough	2
		Collaborate	Good	3
		Quality	Enough	2
		Time	Enough	2
		Price	Enough	2
		Resource Usage	Enough	2
7.	Reeracoen	Integrity	Enough	2
		Collaborate	Less	1
		Quality	Good	3
		Time	Enough	2
		Price	Less	1
		Resource Usage	Enough	2
8.	Shell Infotech	Integrity	Enough	2
		Collaborate	Enough	2
		Quality	Enough	2
		Time	Enough	2
		Price	Good	3
		Resource Usage	Enough	2
9.	XSIS	Integrity	Enough	2
		Collaborate	Enough	2
		Quality	Enough	2
		Time	Enough	2
		Price	Enough	2
		Resource Usage	Enough	2

Source: Data Processed, 2024

b. Calculating Alternative Scores or Total Scores

The calculation process for each alternative is carried out using the formula of the exponential comparison method, using the equation:

$$Total\ Nilai\ (TN_i) = \sum_{j=1}^{m} (RKij)^{TKKj}, 1 \leq i \leq n$$

With

TNi = Total alternative value i

RKij = the degree of relative importance of the j criterion in the choice of decision i

TKKj = degree of importance of the jth decision criteria; TKKj > 0; round

n = Number of alternative options decision

m = Total result criteria

The following is the calculation from Indocyber:

TNI= (3^0.08)+(3^0.05)+(3^0.11)+(2^0.07)+(2^0.09)+(2^0.02)

= 1.0918668996138925 + 1.056467308549538 + 1.0497166836230674 + 1.049716683623 + 1.064370182453 + 1.013959479790029

= 6.326097238

Table 13 shows the total value of each alternative. From the number of calculation results, a middle value of 6,296,338,476 was obtained, which was used as the threshold value to get the recommended alternative to choose the recommended recruitment vendor.

Table 13. Calculation Results

Total Value	Alternative	Calculation Results	Information
TN1	Indocyber	6.326097238	Recommended
TN2	Earth Amartha Technology	6.162595709	Not recommended
TN3	EKSAD	6.312137758	Recommended
TN4	Bosshire	6.427454907	Recommended
TN5	Ekrut	6.177172298	Not recommended
TN6	Glints	6.292564647	Not recommended
TN7	Reeracoen	6.220242633	Not recommended
TN8	Shell Infotech	6.363878077	Recommended
TN9	XSIS	6.287329947	Not recommended

Source: Research Data (2024)

Based on the results of the data analysis presented in Table 13, the total value for each alternative was obtained. The number of calculation results shows a median value of 6,296,338,476. This middle value is used as a threshold value to determine recommended alternatives for selecting a recruitment vendor. Alternatives with a total value above the threshold value are considered recommended options. From the results of the data analysis, four alternatives, namely Indocyber, EKSAD, Bosshire, and Shell Infotech, meet or exceed the threshold value and are recommended for further consideration. Meanwhile, the other five alternatives, Bumi Amartha Teknologi, Ekrut, Glints, Reeracoen, and XSIS, have a total value below the threshold and are not recommended. Thus, the evaluation provides clear guidance for PT XYZ's company in selecting potential recruitment vendors and per the criteria set.

Increased objectivity and accuracy in the recruitment vendor assessment process system at PT XYZ

The hiring process at PT XYZ begins when users or parties who need labor submit a request for manpower. Furthermore, the recruitment team sourced candidates using two methods, namely through vendors or internal hiring. If a vendor is used, the recruitment vendor also conducts a search for candidates to meet these needs. Once a candidate is found, they will be interviewed to evaluate their abilities, experience, and suitability for the required position. Finally, the selected candidates will be announced, and the hiring process will be completed. This process aims to ensure that the company gets the right candidates according to the needs at hand. The hiring process at PT XYZ is shown in the picture below:

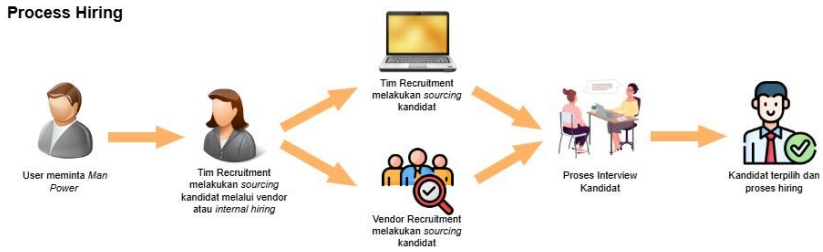

Figure 4. PT XYZ Hiring Process

After conducting the hiring process, especially in the selection of vendors to support the hiring process at PT XYZ, the researcher has created a vendor selection system based on the results of the above research.

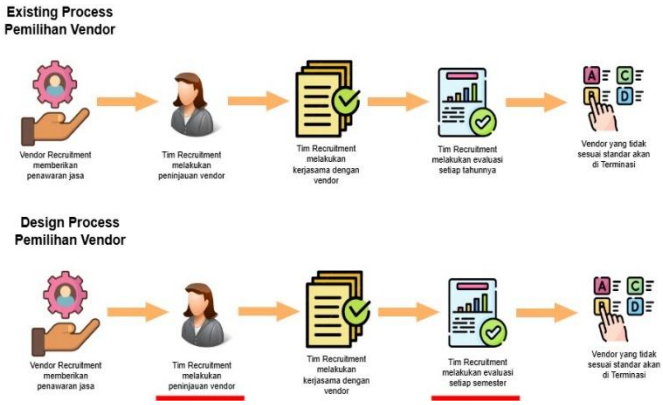

Figure 5. Vendor Selection Design

In the current vendor selection process in the image above is aimed at the existing process, the vendor recruitment provides service offers to the recruitment team, which then conducts a vendor review. Furthermore, the recruitment team works closely with vendors and annually evaluates vendor performance. If the vendor does not meet the standards, they will be terminated. Meanwhile, in the Design Process that the researcher has carried out, although the initial stage is similar, namely vendor recruitment provides service offerings, the recruitment team conducts a vendor review, and then collaborates with vendors, there are changes in the evaluation process. Vendor evaluation in this process design is carried out every semester, not annually as in the existing process. In addition, the evaluation criteria used in this process design focus on research results that are more relevant to assess vendor performance. To improve objectivity and accuracy in

the recruitment vendor assessment process system at PT XYZ, the steps taken involve several critical stages supported by scientific methods and data processing techniques. This research began with the distribution of questionnaires to seven respondents consisting of internal and external parties of the company, which aimed to identify important criteria in the assessment of vendors. The questionnaire results were processed using Microsoft Excel to determine each criterion's average level of importance. Criteria with an average score of less than 3 are declared unimportant and excluded from the weighting process, while criteria with an average score of 3 or more are considered important. Furthermore, the Analytic Hierarchy Process (AHP) method is used to weighting these criteria. In this method, respondents compared criteria using a scale of 1 to 9 to determine the level of relative importance between elements. The results of this comparison were processed with the help of Expert Choice 11 software to ensure data consistency. After that, the priority calculation of the weight of criteria and sub-criteria for each recruitment vendor is carried out. The final step is to apply the Exponential Comparison Method (MPE) to calculate each vendor's alternative total value score. Vendors with values above the threshold are recommended for further consideration, while those below the threshold are not recommended. By implementing this systematic and data-driven approach, PT XYZ can ensure a more objective and accurate vendor assessment process, thereby supporting better decision-making in the selection of recruitment vendors. If vendors don't meet their set standards, they'll be terminated. The main difference between these two processes lies in the frequency of evaluation and review of criteria based on research results in process design.

Conclusion

Based on the research that the researcher has conducted, several conclusions were obtained from the research results, namely: The study's results highlight the imperfections in the vendor selection system that led to suboptimal performance of the vendors chosen by PT XYZ. The analysis concluded that the assessment system was unreliable with the average result of respondents' answers being 1.9. The main drawback lies in the absence of objective and structured assessments in the early stages of recruitment vendor selection, resulting in a lack of transparency, consistency, and difficulty in evaluating the quality and suitability of vendors with the company's long-term needs. The results of the AHP analysis resulted in the weight of each criterion and the sub criteria of PT XYZ's vendor selection. The criteria produced were Integrity with a weight of 0.157, Cooperation criteria with a weight of 0.094, Quality criteria with a weight of 0.235, Time criteria with a weight of 0.219, Price criteria with a weight of 0.244, and Resource Use criteria with a weight of 0.05. Meanwhile, the sub-criteria produced are Good with a weight of 0.485, Sufficient with a weight of 0.315, and Less with a weight of 0.200. Each of the criteria and sub-criteria results in a priority value. The resulting priority value is a reference for designing a vendor selection system with MPE. To increase objectivity and accuracy in the recruitment vendor assessment process system at PT XYZ, a systematic approach was used that included the identification of important criteria through questionnaires, weighting of criteria using the Analytic Hierarchy Process (AHP) method, determination of sub-criteria, and calculation of the total score of vendor alternative values with the Exponential Comparison Method (MPE). In addition, changes were made to the vendor evaluation process, which was originally carried out annually in the existing process to be evaluated every semester in the design of the new process. This change aims to ensure that vendor performance monitoring is carried out more regularly, allowing

corrective actions to be taken immediately and supporting more responsive and accurate decision-making.

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