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Analysis of human resource management in building a sustainable competitive advantage of the herbal medicine industry

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Abstract. Jamu is a traditional herbal drink from Indonesia, and Madura is known for its high-quality herbal products. Madura's herbal products are recognized for their effectiveness both regionally and internationally. One of Madura's most significant obstacles to developing the herbal industry is the lack of Government role in training and assisting herbal industry actors and resources. Therefore, the research objective of this study was to analyze the management of human resources in building the competitive advantage of the Madurese herbal industry, especially in the Pamekasan area, which was the most extensive herbal medicine-producing area. This research used a systematic literature review to identify, study, evaluate, and interpret a phenomenon. The process for this research was based on five steps: selecting, reviewing, and quality assessment of the reviewed literature. The results showed that the management of human resources in the Madurese herbal industry has begun to form through associations, and there were developments in the innovation of herbal products. Furthermore, several strategies can be applied to create a competitive advantage, including increasing promotion and market share, human resources through training and mentoring, legality and licensing, packaging and product innovation, technology use, and expanding cooperation partners.

1. Introduction

The industrial sector is one of the mainstay sectors of the national economy, and even the manufacturing sector is the largest business field in employment [1]. The herbal medicine (jamu) industry was established in Indonesia in the 1900s [2]. Jamu, a traditional Indonesian herbal drink derived from plants and spices, was designated Indonesia's Intangible Cultural Heritage (WBTb) by UNESCO in December 2023 [3]. The advantage of developing herbal medicine in Indonesia is that it uses 9,600 types of medicinal plants as the basis of herbal medicine [4]. From an economic perspective, BPS data shows that the chemical, pharmaceutical, and traditional medicine industries continue to increase. In the first quarter of 2021, the three industrial sectors recorded a growth rate of 11.46%. Not only on a national scale, but the export value of the chemicals, pharmaceuticals, and traditional medicine industry sector in January-March 2021 also contributed USD 4.30 billion, one of the three industries that provide the most significant value. This was conveyed directly by the head of the Food and Drug Supervisory Agency when attending the 2021 National Work Meeting of the Herbal Entrepreneurs Association [5].

The herbal medicine and traditional medicine industry is one of the industries that can survive amid the economic and political crisis that hit Indonesia. This is due to the tendency of



Indonesians to return to nature, the abundance of raw materials, the high price of chemical drugs, and the increasing number of people who prefer traditional medicine over modern medicine [6]. Madura is one of the islands with many industries, including micro, small, and medium enterprises, that produce jamu products [7]. Women in Madura usually drink jamu postpartum so their bodies become healthy again. In addition, drinking jamu can be believed to maintain health from various diseases.

Madurese herbal medicine is widely recognized for its efficacy regionally, nationally, and internationally. However, this cannot guarantee that the Madura traditional herbal medicine industry can develop well [8]. Herbal medicine is one of the local resource-based products and requires strategic principles to maintain its quality. The number of herbal medicine production in 2021 that is still in production in Sumenep Regency is 11 herbal medicine industries, Pamekasan Regency is 25 herbal medicine industries, Sampang Regency is 3 herbal medicine industries, and Bangkalan Regency is 8 herbal medicine industries [9]. This shows that Pamekasan Regency has Madura's most extensive herbal medicine industry.

Based on the results of the researcher's preliminary observation with the Pamekasan Regency Industry and Trade Office, Pamekasan is one of the regencies in Madura which has a herbal medicine industry spread across 13 sub-districts, with a total of 76 herbal medicine industries and a labour absorption of 187 people in 2024. If calculated based on the average workforce per industry, only 2-3 people work there. This means that although Madurese herbal medicine is widely recognized nationally and internationally, the absorption of human resources in Pamekasan Regency is still relatively low.

Human resources (HR) must be considered because it drives a business's industrial development [10]. Improving quality human resources, understanding efficient seaweed cultivation techniques, environmental management, and adaptation to technology and market changes are key factors in increasing seaweed production and creating competitive advantages and global competitiveness.

Apart from that, the results of the pre-survey conducted by researchers show that one of the obstacles to the development of the herbal industry in Pamekasan is the lack of Government involvement in providing training and assistance to herbal industry actors and resources. This is supported by the results of Ekna Satriyati's research, which stated that the challenges of Madurese herbal medicine are the lack of social networks between herbalists and the absence of Government support in development programs and policies. Therefore, this research must examine how human resource management in building conservation and sustainability policies of Madurese herbal medicine can have a competitive advantage amid market competition and industrialization of herbal medicine.

2. Method

This article conducted a systematic literature review, beginning with human resource management and then examining its application to the herbal medicine industry, specifically Madurese herbal medicine, and how to create a sustainable competitive advantage. "systematic literature review" refers to a specific research methodology used to collect and evaluate research on a particular focus topic.

The SLR process in this study was based on the five steps proposed by Khan et al. conducted for various purposes, including identifying, studying, evaluating, and interpreting all available research in the subject area of a phenomenon of interest, with specific relevant research questions [11][12][13]. The authors explained the tasks accompanying systematic literature reviews, such as selecting, reviewing, and assessing the quality of the reviewed literature [13]. The five steps and actions taken by researchers are as follows:

2.1 Framing the question for the review

In this step, the research question and the related terms should be specified before the start of the actual literature review. In the case of this research, there were three parts or three research questions: QR1 is how has the herbal medicine industry developed in Madura?; QR2 is how is the human resource management of the Madura herbal medicine industry?; and QR3 is how is the strategy to create a competitive advantage in the Madura herbal medicine industry?

2.2 Identifying relevant work and works of literature

To capture as many relevant citations as possible. This study focused on electronic resources and documents containing the keywords 'jamu madura' and 'sumber daya manusia industry jamu'. Specifically, the resources were journals that were concerned with Jamu Madura.

2.3 Assessing the quality of the found studies

In this step, the discovered papers or publications would be filtered according to some quality measures to filter the found publications. These standards were as follows: The paper must relate to the research question. The publication must have a transparent methodology. The research must come from trusted resources and journals. In this regard, since the findings cannot be generalized, The publication year of the papers must be 2005 or above.

2.4 Summarizing the evidences that answer the research

In this step, the discovered evidence related to the research questions was gathered and summarised to prepare them for the fifth step, which was data analysis or findings interpretations.

2.5 Interpreting the findings.

In this final step of the study, the results from the previous steps were analyzed to conclude how human resources are managed in the jamu industry and the strategies that can be used to create a competitive advantage in building a policy of conservation and sustainability of Madurese jamu. Based on this explanation and the importance of examining the Critical Success Factors, 32 articles were thoroughly investigated to determine their relevance to the topic under investigation and to answer the research questions for this study. Furthermore, 18 papers were examined and subsequently rejected. These articles were rejected because of one or more of the following reasons: (1) The year of publication is older than 2014; and (2) Some papers were not related directly to managing human resources in the Madura herbal medicine industry.

3. Results and Discussion

Based on the 14 article sources determined to meet the criteria, the research results are in Table 1.

Table 1. Research on Madurese herbal medicine and human resource management

No	Title	Author name	Year	Methods	Findings
1	The business development strategy of jamu at pt. Firdaus kurnia indah (fki) in bangkalan regency	Yunita eka dyah pratiwi, setiani, ifan rizky kurniyanto	2024	Qualitative	Pt. Fki has thirteen internal factors and eleven external influencing factors in its business. The company's biggest strength is using natural ingredients. The biggest weakness is the lack of product stock opportunities. The biggest threat is the advances in technology and social media, and the biggest is the emergence of similar competitors.
2	Business development strategy in medicine	Rohematus solehah, resti prastika	2022	Qualitative	Strategies that can be implemented are: a) increasing promotions and expanding marketing areas and b) increasing partnerships with sellers of traditional herbal

No	Title	Author name	Year	Methods	Findings
3	traditional smes in madura through swot analysis approach Model pengembangan agrowisata jamu ramuan madura di kabupaten sumenep	destiarni, dewi muti'ah Ika fatmawati p. Dan arfinsyah hafid a.		Qualitative	medicine raw materials. C) improving relations with the government and other institutions d) providing training and guidance in obtaining permits e) certification of traditional madurese herbal medicine forms Madurese herbal medicine agrotourism has the potential to be developed in matanair village, rubaru district, sumenep. Herbal plant commodities serve as raw materials for madurese herbal medicine and have significant potential for development. The appropriate madurese herbal agrotourism development model to use is a community-based agrotourism development model.
4	Strategi pengembangan jamu ramuan madura di kabupaten sumenep	Ika fatmawati p, nur qoudry wijaya	2021	Qualitative	The appropriate strategy to be applied to producers of madurese herbal medicine is (a) increasing promotion and expanding marketing areas, (b) packaging modifications, (c) technology to reduce the strong aroma of herbal medicine, (d) providing training and assistance in obtaining permits.
5	Strategi pengembangan ukm jamu tradisional madura ayu	Farida dan elys fauziyah	2020	Qualitative	Strategies that can be developed using qspm calculations are developing innovative packaging for herbal medicine products, collaborating with spice farmers, increasing marketing through various media, making maximum use of support from the government in terms of capital, assistance and managing business legality, and providing bonuses, to customers who buy products in large quantities.
6	Konseptual model dalam meningkatkan profitabilitas produksi jamu madura dengan pendekatan sistem dinamis	Abdur rozaq amirudin, ernaning widiaswanti	2024	Qualitative	This research discussed modelling conceptually developed to increase the profitability of madura herbal medicine msms using a dynamic system model. The conceptual modelling developed represents the existing production, sales, income and profit conditions. The model developed must undergo further evaluation and validation, and then an appropriate strategy will be found to increase the profitability of jamu madura msms and make them sustainable.
7	Business development strategy in medicine traditional smes in madura through swot analysis approach	Rohematus solehah, resti prastika destiarni, dewi muti'ah	2022	Qualitative	Traditional herbal medicine msms in pamekasan regency have engaged with the government regarding their development. Diversification of traditional herbal medicine products is needed to compete with those made by machine companies.
8	Strategi pengembangan paguyuban potre madhura melalui pendidikan jamu di pulau madura	Alfan biroli, ekna satriyati	2022	Qualitative	The traditional herbal medicine industry group in pamekasan district is included in the community group. The potre madhura association is a pioneer in developing madurese herbal medicine. The potre madhura association is comprised of madurese, a medical business actor that produces and markets madurese herbal medicine. Strategy to develop madurese herbal

No	Title	Author name	Year	Methods	Findings
9	Analisis strategi pengembangan industri jamu tradisional di kabupaten bangkalan	Risa dewi munica, millatul ulya dan muhammad fakhry	2017	Qualitative	medicine through internal and external herbal medicine education. From the internal side, it is carried out at the madhura potre community association to educate its members on madurese herbal medicine. Meanwhile, from the external side, the madhura potre community is in contact with the outside community. Socialization of herbal medicine education is carried out in several places, namely car free day (cfd), markets and homes. Priority strategies that the herbal medicine industry can implement in bangkalan regency include: 1. Maintaining and improving product quality 2. Increasing promotional activities and expanding marketing areas 3. Improving relations with the government and other institutions 4. Maintaining the company's image, and 5. Developing cooperation with other industries outside the region
10	Ibm home industri jamu tradisional madura untuk meningkatkan daya saing di kabupaten pamekasan	Zainol arifin, fitrah yuliawati, syafrawi	2016		Based on the results of the ibm implementation for the traditional herbal medicine home industry group, several things can be concluded: a. With the ibm program for the traditional herbal medicine home industry group in pakong district, it has formed/developed an independent economy; able b. Ibm has been able to improve creative thinking skills to develop abundant natural resources into superior products with high economic value
11	Kearifan lokal orang madura tentang jamu untuk kesehatan ibu dan anak	Mudjijono et al.	2014	Ethnoscience	Knowledge about using natural madurese herbal ingredients is a tradition their ancestors passed down from generation to generation. Most madurese people still maintain local wisdom, including alternative medicine, by drinking herbal medicine. Drinking herbal medicine is not only to treat disease but also to care for and maintain the health of mothers and children.
12	The role of the herbalist in building the identity of madurese traditional herbal medicine (jamu)	Sri ratnawati	2019	Ethnography	To date, knowledge about making jamu has been passed down from generation to generation using the oral transmission model. The structural nature of this inheritance system, from parents to children and others, was an internal policy in the families of herbalists and can be viewed as a 'political' policy, the goal of which was to preserve the cultural identity of the group rooted in its institution. In the future, it will be essential to integrate the role of herbalists in government policy and education institutions.
13	Business model of jamu as indonesian traditional herbal medicine in new economy	Fatya alty amalia and atik aprianingsih	2017	Literature review	The pss concept accommodated the adoption of information in the new business model of herbal medicine. After considering the characteristics of herbal medicine companies, the product model-oriented business in pss was the appropriate business model for herbal medicine. The managerial implications of this research were mainly to offer herbal medicine business ideas to survive in the competition in

No	Title	Author name	Year	Methods	Findings
14	Analysis and design of indonesian traditional medicine (jamu) information system by using prototyping model (case study: madura island)	Rika yunitarini and ernaning widiaswanti	2024	Prototyping model	the new economy. By adopting pss as a collection of solutions for customers, companies may move closer to achieving their goals. From the performances, information, economic, control, efficiency, and service (pieces) analysis, it was found that madurese herbal medicine information needs to be managed more appropriately so it can give advantages for wide society and provide access to madurese herbal medicine information. Unified modelling language (uml) design provides an overview of what the information system will do, like data management and displaying madura herbs information

3.1 Development of the madurese herbal industry

The history of jamu in Madura is that the term “jamu” comes from the Old Javanese language “jampi” or “usodo”, which means healing using medicinal herbs, prayers, and magic. Jamu, which was initially only known in the palace environment, has begun to leave the palace environment through “dukun” or traditional medicine doctors. However, it is still used in a limited environment [14] [13][14]. However, after botanists published writings on the variety and benefits of plants for medicine, it could be enjoyed by all levels of society. Later, herbal medicine made by households began to develop into an industry in the early 1900s [15]. According to Jonosewojo, in 1900, many herbal medicine industries existed in Indonesia. They formulate herbal medicine with quality and hygienic ingredients that can overcome various diseases using five superior plants, such as gotu kola (*Centella Asiatica*), temulawak (*Curcuma xanthorrhiza roxb*), sambiloto (*Andrographis paniculataburms. f-ness*), kencur (*Kaempferia galangal, Linn.*) and jahai (*Zingiber afficinale roxb*) [16].

Based on information and data from several informants, Madurese herbal medicine has existed since the ancestors who have been passed down. Some have even started making Madurese herbal medicine since 1908. This shows that Madurese herbal medicine has been known for a long time. As stated by A. Rifai (Rifai, n.d.), the reputation of Madurese herbal medicine is deeply rooted in cultural traditions, primarily because its intended purpose is to foster a harmonious household characterized by *sakinah, mawadah, and rahmah*, where husbands, wives, and their children share equal rights and responsibilities. The underlying wisdom is generally told directly or in passing by a mother, a bridal dresser, or a trusted older person.

Then, if noticed, most herbal drinkers in Madura are women. In the past, Madurese girls as young as 4 or 5 years old were introduced to herbal medicine. Because from a young age, young women have been taught to enjoy drinking traditional herbs such as *beras kencur* and *jamu shinom*. After adulthood, they then become accustomed to jamu. This habit sometimes causes some Madurese to be very extreme or fanatical, going so far as to say that it is better not to eat than not to drink jamu. At least in their youth, for a Madurese girl who has just experienced her first menstrual period, a special jamu is available, the purpose of which is 'disguised' by saying that the jamu she drinks will increase their attractiveness [15]. The meaning of 'disguised' here is that most delivery mothers suggest that herbal medicine should be introduced to motivate the child by saying it will increase their charm. Even though the actual benefits of drinking herbal medicine during menstruation are to maintain health, tighten the uterus, and overcome menstrual pain.

3.2 Human resource management in the madurese herbal industry

The management of Madurese herbal human resources, especially in the Pamekasan area, the region with the most significant number of herbal industries in Madura, is organized in the herbal paguyuban. Paguyuban serves as a group dedicated to overseeing and promoting the preservation and development of the Madurese herbal industry in Pamekasan, ensuring that traditional practices are upheld while fostering innovation in herbal medicine. [17] [18][19]This paguyuban tremendously influences its members and fellow Madurese herbalists who run the Madurese herbal industry. One of the roles of the paguyuban is to facilitate the socialization of Madurese herbal education and to innovate the development of Madurese herbal medicine. The Madura herbal education paguyuban strategy has benefits for the group in passing on the knowledge, attitudes, and skills of Madura herbal medicine from generation to generation [20][21][22].

Every three months, paguyuban members meet to discuss the development of the Madura herbal medicine business. Furthermore, from here, an innovation of Madurese herbal medicine was also born, which has begun to be packaged in bottles and has a variety of flavours. This is done to maintain the development of Madurese herbal medicine to continue to exist and be liked by the public, both those new to herbal medicine and to attract the interest of young people and children [23]. Even so, this innovation is carried out while maintaining the quality of the ingredients by using natural ingredients and not contaminating them with chemicals. The authenticity of Madurese herbal medicine is a priority in maintaining services with consumers. In addition, they already have an activity plan and organizational structure with its main tasks and functions. The herbal industry association also has a mission formed and agreed upon with its members so that activities are planned toward common group goals.

3.3 Competitive advantage strategy for the madurese herbal industry

The prestige and popularity of Madurese herbal medicine are challenging to match in providing health benefits for its users, but this strong brand image is insufficient. A competitive advantage is also needed to survive and compete with the Madurese herbal medicine industry. From various studies of the herbal medicine industry in Madura, several strategies can be applied, one of which is [7][10][6][19] [8][3]: (1) increased promotion on social media and e-commerce and expansion of marketing outreach; (2) conduct training and development of human resources of Madura herbal industry craftsmen; (3) utilization of technological tools to increase the productivity of Madurese herbal medicine; (4) Conduct training and guidance in obtaining business licenses and legality; (5) innovate Madurese herbal products, both products and packaging that are adapted to market developments; and (6) improve partnerships and cooperation both with the local Government and with sellers of herbal raw materials.

4. Conclusion

The analysis of human resource management research results in building sustainable competitive advantage in the herbal medicine industry, and it can be concluded that the history of Madurese herbal medicine was initially only known in the palace environment. Still, it began to develop into an industry in the early 1990s. The popularity or fame of Madurese herbal medicine has a thick cultural background. It is passed down from generation to generation orally or generally told directly by mothers or older people. Human resource management in the herbal industry has been nobly formed and organized into herbal medicine paguyuban. This Madura herbal medicine paguyuban has an activity plan and organizational structure with its main tasks and functions. It also has a mission that is formed and agreed upon with its members so that the planning of activities carried out is directed towards common group goals. The strategies that the Madura herbal industry can apply in creating a sustainable competitive advantage are expanding media and promotional channels, improving the quality of human resources through training and assistance in the use of technology and licensing to create innovation and increase the

productivity and quality of the Madura herbal industry, as well as increasing partnership links and cooperation both with the local Government and with sellers of herbal raw materials.

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