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Smart Herbs IoT

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ABSTRACT

This National Collaborative product program activity takes the form of utilizing the Internet of Things as the development of information technology with the concept of intelligent health care which is gradually becoming the latest information technology. This health care uses a series of information technologies as platforms, including the Internet of Things, Big Data, Cloud computing and artificial intelligence to process and transform the plant-based health system so that the application is efficient and comfortable for users. The aim of introducing and familiarizing with the application of information technology using multiple devices such as smartphone devices and personal computers to farmers and herbal plant entrepreneurs, it is hoped that this can improve the conditions and capabilities of processing herbal plants into a profitable business in terms of costs and technological efficiency. The research instrument uses data from the Ministry of Health for statistical data and the sample used is the use of an application prototype. The Research Team has conducted preliminary observations and interviews regarding the need for information technology infrastructure to be implemented in Wanayasa Village, West Java Regency, West Java Province in order to improve the welfare of herbal plant entrepreneurs. The final results of the first year of research will be that training will be held regarding the application of herbal plant information system technology so that farmers and herbal plant entrepreneurs as well as consumers and partner teachers in the field of chemistry and health workers will be able to adapt models of scientific and technological progress into the work and business, they undertake published in the indexed journal SINTA 1. In the second year an application prototype will be produced with publication in a Scopus indexed journal so that it will bring benefits, especially for improving the welfare of herbal plant entrepreneurs.

1. Introduction

The condition of farmers and herbal plant entrepreneurs in West Java Province, especially in West Java Regency, has not received maximum protection by the Regional Government or by the Central Government. In Indonesia there are 35 thousand types of herbal plants compared to 45 thousand types in the world [4]. Of this amount, 1000 tons are used for the herbal plant industry for traditional health care and services per year for raw materials for the traditional herbal medicine industry, herbal

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medicine industry, non-herbal industry and export needs [4]. Based on data from the Central Statistics Agency managed by the Ministry of Trade, the total export value of Indonesian herbal medicine in 2021 will reach USD 41.5 million [20]. Best-First Search is a search technique that uses knowledge of a problem because body conditions of most people are also very diverse, so that the healthy lifestyle of each person is different according to their history [2].

Traditional health care and services use herbal plants which refer to experience and skills passed down empirically which can be accounted for and applied in accordance with the norms applicable in society [15]. Traditional health services using herbal plants are an application of traditional health that utilizes biomedical and bio cultural science in its explanation and its benefits and safety can be scientifically proven [14]. The need for public health services focuses on the increasing efficiency of health care [14]. Efficient health care and services using intelligent health maintenance concepts explain the achievement of the status of the Smart Herbs IoT application in increasing the development of modern health maintenance concepts in this research to level 7 [14].

The smart health services and care comes from the "Smart Planet" concept proposed by IBM [19]. The Smart Planet concept is an intelligent infrastructure that uses sensors to understand information, send information via the internet of things (IoT), and process information using information system technology [14].

Smart traditional health services and care are health service systems that use IoT information system technology and mobile internet to be able to access information dynamically by connecting mobile users, materials and related institutions and then actively managing and responding to the needs of the medical ecosystem [14]. Traditional health services and treatments using herbal plants are a higher stage of information system construction in the medical field [1].

Traditional health services and care using Smart Herbs information technology involve many users from doctors and patients, hospitals and research institutions. Smart information system technology is an organic entity in Indonesia in the health sector that started in 1986 [11]. As mentioned, the ecosystem in the health sector consists of several components, namely users (patients at various economic levels), the government as regulator and facilitator, doctors, hospitals, pharmacies, the drug industry, administrators, health insurance companies and other health supporters [5]. These components can and have built their own information and communication technology with the support of existing infrastructure, but due to user mobility, the administration of the same health care user's medical records across several facilitators can be integrated with a good and adequate information technology system using cloud computing and the Internet of Things [3].

The challenge faced by Indonesia is that when it needs health service providers, patients often move from one health facility to another with more complete facilities and infrastructure and these patient movements are not properly recorded by the health facilitators provided by the government so that patients have medical records handling over the treatment to traditional facilitators [3]. Traditional health service providers can actually be overcome with IoT (internet of things) and adequate sophisticated applications in accordance with the Industrial Revolution 4.0 [3]. Constraints on the availability of adequate information technology infrastructure for Smart Herbs IoT are also an obstacle in health services and care for patients [5,6].

Based on the priority regional development program contained in the 2015 West Java Regency Regional Development Planning Agency in the 2015 Pre-Musrenbang BKPP Region II West Java Province which was determined by the Head of the West Java Regency Bappeda in point 4, it is stated that the West Java district government will strengthen the Traditional Medicine Center and Granary. Traditional medicine in several sub-districts, namely Pasawahan, Pondoksalam, Wanayasa, Kiarapedes and Darangdan [4]. The concentration of herbal plant farmers in West Java Regency as an

improvement in the field of herbs or medicinal plants can also be an educational forum for students and other communities to cultivate and produce herbal plants and refer to various kinds of information regarding herbal plants [4]. Meanwhile, the infrastructure that this district already has is expected to provide easy, efficient, and interesting assistance to the public in learning and utilizing home medicinal plants [1]. To integrate traditional medicine into the health service system, seven steps are needed that can be realized, namely formulating a strategy for integration; establish regulations for integration; establish service and competency standards; training and education for conventional providers and traditional medicine practitioners [18].

The Smart Herb information system aims to integrate traditional medicine into the health system and build partnerships and networks with the association of herbal medicine entrepreneurs, namely the Indonesian Health Supplement Entrepreneurs Association (APSKI) [17].

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The design stage is carried out by creating a navigation structure, program flow and application appearance [7]. Then the testing stage of the application that has been created is tested using programming so that the results can be improved on the application [10].

The system implementation stage is the final stage in this research [9]. If the testing stage is successfully carried out, the researcher first installs the application on the smartphone device that has been provided [8]. The maintenance and development stage of Smart Herbs is carried out if there are problems with the features and functions of the application [13].

The stages of preparing articles and publications are mandatory outputs that must be carried out in this research [14]. The publication of scientific work will later be published in the reputable and accredited online journal Sinta 1.

2. Methodology

The method used in this National Collaborative research is literature study, analysis method using fishbone diagrams for viewing and design methods [13]. The analytical method is used to examine the problems faced by the regional government work unit of the RSUI Health Service and presented in seminars on Lab School and Herbs Institutions [12,16]. The design method is used by using hardware, software, brain ware server and client specifications to design a software prototype design

that can solve the problems faced, then after that the software testing stage is carried out to test whether the software created as a prototype is able to process transactions in the system properly and been presented in Figure 1 [5]. Then implementation is carried out in the form of training for users and been presented in Figure 2 [19].

No.	Kode Jamu	Nama Jamu	Harga Beli	Harga Jual	Stok	Status
1	000001	Jamu Beras Merah	Rp. 20.000	Rp. 25.000	12	Stok
2	000002	Jamu Beras Kuning	Rp. 20.000	Rp. 25.000	12	Stok

Fig.1. Herbals Information data



Fig.2. Herbals dashboard

3. Results

The expected output of this National Collaborative research program is the determination of a budget to increase the literacy of the farming community, entrepreneurs and consumers of herbal plants in terms of Smart Herbs *IoT* herbal plant-based information technology in Figure 3.

No.	Kode Jamu	Nama Jamu	Harga Beli	Harga Jual	Stok	Status
1	000001	Jamu Beras Kuning	Rp. 20.000	Rp. 25.000	12	Stok
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Fig.3. Menu Print Herbal

4. Conclusions

The Modules above are providing users to access accurate, transparent and accountable reports regarding to national health requirements at the provincial government of Indonesia.

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References

- [1] Khomaeni, Nasrullah, and Muhammad Zakariyah. "Aplikasi Augmented Reality Tentang Pengenalan Tanaman Obat Rumahan Berbasis API." *JSAI (Journal Scientific and Applied Informatics)* 6, no. 3 (2023): 358-371. <https://doi.org/10.36085/jsai.v6i3.5820>
- [2] Yusuf, Arif Maulana, Apit Priatna, and Cherly Cristiani. "Rancang Bangun Sistem Pakar Pola Hidup Sehat Berbasis Web Dengan Metode Forward Chaining." *Jurnal Teknologi Sistem Informasi dan Sistem Komputer TGD* 5, no. 2 (2022): 109-117. <https://doi.org/10.53513/jsk.v5i2.5639>
- [3] Noviarini, Diena, and Eko Arif Syaefudin. "Design application models in the field of health in the Indonesian health ministry using COBIT database administration for standardization based on Indonesian national standard." In *AIP Conference Proceedings*, vol. 2331, no. 1. AIP Publishing, 2021. <https://doi.org/10.1063/5.0041697>
- [4] Suwandi, Dhia Fitrianti, and Irina Mildawani. "Kajian Pusat Tanaman Herbal sebagai Pendukung Pembangunan Keberlanjutan: Studi Kasus di Kabupaten Purwakarta, Jawa Barat (Study on Herbal Plants Center as a Supporter of Sustainable Development: Case Study in Purwakarta Regency, West Java)." In *Seminar Nasional Kota Berkelanjutan*, pp. 254-270. 2018. <https://doi.org/10.25105/psnkb.v1i1.2906>
- [5] Harwikarya, M. Sadikin, Devi Fitriana, Mohammad Mustofa Sarinanto, Ida Nurhaida, and A. R. Dwiyanto. "IS Strategic Plan for Higher Education Based on COBIT Assessment: A Case Study." *International Journal of Information and Education Technology* 5, no. 8 (2015): 629-633. <https://doi.org/10.7763/IJiet.2015.V5.581>
- [6] Kristianto, Edy. "E-health di Indonesia." *Jurnal Teknik dan Ilmu Komputer* (2013).
- [7] Rama, Jones, and F. L. Jones. "Accounting Information System a Business Process Approach." (2003).
- [8] Lasimin, Lasimin, Tatang Tajudin, and Nikmah Nur Rochmah. "Aplikasi Swamedikasi Thibbun Nabawi Untuk Peningkatan Imunitas di Masa Pandemi COVID-19." *Device* 12, no. 2 (2022): 137-143. <https://doi.org/10.32699/device.v12i2.3562>
- [9] Suarta, I Made, and IGA Oka Sudiadnyani. 2014. "Studi Faktor Penentu Penerimaan dan Penggunaan Sistem Informasi Akuntansi Pada Lembaga Perkreditan Desa". *Jurnal Sistem Informasi* 10 (1), 44-51. <https://doi.org/10.21609/jsi.v10i1.377>
- [10] Noerlina, Noerlina. "Rancangan Sistem Informasi Rumah Sakit Subsistem: Pengelolaan Inventory dan Transaksi Obat." *CommIT (Communication and Information Technology) Journal* 3, no. 1 (2009): 12-19. <https://doi.org/10.21512/commit.v3i1.507>
- [11] Nugroho, Prasetyo. "Penyelenggaraan IOF ISO 26000 Dan CSR 2018 - BSN - Badan Standardisasi Nasional - National Standardization Agency of Indonesia - Setting the Standard in Indonesia ISO SNI WTO." Bsn.go.id, 2018. <https://www.bsn.go.id/main/berita/detail/9785/penyelenggaraan-iof-iso26000>.
- [12] Labschool. "SMA LABSCHOOL KEBAYORAN," n.d. <https://kebayoran.labschool-unj.sch.id/info-profil/>.
- [13] Jakarta, Universitas. "Rencana Induk Penelitian." <https://fis.unj.ac.id/gpjm/wp-content/uploads/2022/10/rip-unj.pdf>.
- [14] Tian, Shuo, Wenbo Yang, Jehane Michael Le Grange, Peng Wang, Wei Huang, and Zhewei Ye. "Smart healthcare: making medical care more intelligent." *Global Health Journal* 3, no. 3 (2019): 62-65. <https://doi.org/10.1016/j.glohj.2019.07.001>
- [15] Giyawati Yulilania Okinarum. *Pemanfaatan Dalam Bidang Herbal Dan Kebidanan*. Pustaka Panasea, 2023.
- [16] DeLone, William H., and Ephraim R. McLean. "Information systems success measurement." *Foundations and Trends® in Information Systems* 2, no. 1 (2016): 1-116. <https://doi.org/10.1561/2900000005>
- [17] Chandra. "Dukung Peningkatan Pertumbuhan Ekonomi, Badan POM Kawal Pengembangan Obat Bahan Alam | Badan Pengawas Obat Dan Makanan." Pom.go.id, 2021. <https://www.pom.go.id/berita/dukung-peningkatan-pertumbuhan-ekonomi-badan-pom-kawal-pengembangan-obat-bahan-alam>.
- [18] Rokom. "Integrasi Pengobatan Tradisional Dalam Sistem Kesehatan Nasional." Sehat Negeriku, November 2, 2011. <https://sehatnegeriku.kemkes.go.id/baca/rilis-media/20111102/541807/integrasi-pengobatan-tradisional-dalam-sistem-kesehatan-nasional/>.

- [19] Mohammad Ghozie. "IBM Makin Fokus Dengan Smarter Planet." Kompas.com, October 9, 2019. <https://nasional.kompas.com/read/2009/09/10/11202325/ibm-makin-fokus-dengan-smarter-planet>.
- [20] Kementerian Luar Negeri Republik Indonesia. "Exports of Indonesian Jamu (Traditional Herbal Drinks/Medicine) Are Increasing during the Pandemic," 2021. <https://kemlu.go.id/penang/en/news/16139/exports-of-indonesian-jamu-traditional-herbal-%20%20%20%20%20%20%20%20%20%20%20drinksmedicine-are-increasing-during-the-pandemic>.