

# Web Design and Application Programming Interface (APIs) Application for Intelligent Farming

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**Abstract**—In America Agriculture is a most valuable job. However, the sector of agriculture has a many of crowds in this step, from kindergarten to diet and harvest, especially when the modern Corona epidemic has a major impact, so we require different beauty from the teams required in reducing the epidemic. This method remains effective and efficient to high the outcomes of agricultural products. Is a way to reduce this issue is to engage in the fast-growing generation. The time to support the rural system. which can be called the smart agriculture era. Technology is able to collect records and reveal the facts of hydroponic plants during planting so that same action taken without delay. The time that one can build on the web and the APIS (utility Programming Interface) in Application for Intelligent Farming is able to create the planting process stronger and greener.

## I. INTRODUCTION

Agriculture is the most valuable financial fields in America. The Institute for Policy Research according to that agricultural outcome will decrease by 2.57 to 6 percent. similarly, production was also able to decline due to a decrease in the number of workers in the agricultural sector by 2.57 % .88% due to the Covid 19 outbreak but in the other hand, at some point in the corona epidemic, as a gift, the mathematical technology sector, especially the virtual one, which requires internet adoption, has the potential to grow rapidly, it has been shown that visual companies and YouTube, are approaching. , goggle meet has the potential for significant development for users, especially while the government is implementing the WFH policy (make money at home), where all activities are done locally (America, 2019) [10].

To handle the problem of agricultural production, it is important for technology related

to agricultural production. The season and agriculture is often intelligent system. Intelligent farming technology will evaluate the method of planting the plants to harvest in the hope that the production method may be more effective and efficient to increase agricultural production. at the moment, one of the fastest growing technologies [11], [12]. With the net, All statistics and data can be transmitted efficiently and successfully and may download and display many statistics which can be used on a variety of devices [13]. The development of the smart phone era (mobile phone) has also started to make people rely on these gadgets. America dependent on mobile phones cannot be differentiated from the useful features provided by the making of this device. In terms of the making of these devices, the systems that equally help the use of android Phones with functionality is equally followed. in addition, analysts expect Indonesia's mobile phone market

to grow by 5% by 2019. The apps on android Phones is now beginning to flourish the android Phones running an Android operating device, from standalone software to software which can build to other packages [14], [15]. This generation is called the net service that can provide contributions to a variety of gadgets including android Phones. primarily based on agricultural problems and your relationship to state-of-the-art technology development, it is very important to build a web-based data system to purchase and complete all the information obtained throughout the planting process, the protection method of crop harvesting. The machine created also has an APIS to help related packages. This is shown in Fig 1.

## II. LITERATURE

In the following section we are going to give a brief review of the work done till now.

### A. Scientific Study

The following describes a few related lessons about web APIS service:

Nina, Rachman, and Surahman (2020), a virtual reality (E- Tandur) artificial gadget based on Intelligence. In this regard, the Internet-based agricultural statistics (IoT) machine used to increasing the accuracy of the first phase of products by inbuild mathematical frameworks in the rural areas it increases start- ups and increase the value of agriculture [1,17] [1].

Saptri & Mulyno (2018), An exploring and editing of an online Harvest-based statistical information reporting system Reporting to Jambi Province Agriculture Provider. The built- in fact machine supports the process of recording, processing, statistical analysis in the reporting system. Therefore, a built- in fact machine can be very helpful in transmitting facts that support selection. [2], [16]

Aprini (2019), designing an online reality marketing prod- uct program based entirely on the city of PagarAlam. in this study, which is to design a reality device to advertise accurately and as it should be a rural sale in the city of PagarAlam. so that the rural products of the PagarAlam metropolis are visible to people of PagarAlam, a great way to attract customers to buy. [3]

Elmayti & Hazilwati (2018), Model of messages Gateway- based statistics Agricultural system.

Through the Gateway era, farmers in the MusiRawas region. It finds it simpler to make statistics on agricultural cropping methods, agricultural equipment costs and agriculture problems [4], [17].

Eosina, Prim sari, and Ridwan (2018), information plant management system (SITANO). In this experiment, the virtual device was transformed into a web primarily designed to provide the management of medicinal plants. The built-in math's gadget having many records that start with preschool games, plant care, [5] Lulandari, herbal medicine data machine. This database contains data about natural flowers, the contents of those flowers, houses and ways to process these plants for use in the preservation of medicinal flowers. [6]

Sundar (2017) Is a recording system for community donations. This patient care provider statistics device is designed to develop slower guide structures so that services appear less efficient and greener, to create an automated statistics device, [7]

(Prastyo, Fauz, Suprtman, & Murti, 2017), A web-based intelligent Farming statistical device gadget to determine the potential for Harvesting in the Agriculture area. This recording device is making to provide a person with an early detection statement. [8]

### B. WEB

Cambridge Dictionary: a collection of fact sheets on the Internet with almost any problem, published by an equal per- son, organization, or organization, and consistently compiling images, movies, and sounds.

Websites can be created and managed with the help of individuals, agencies, companies or companies to perform various functions. together, all public websites represent the world's largest network (Technopedia, n.d.).

An Internet site is a web-based web page that normally in- cludes a collection of records within text information, images, animations, sound, video or a collection of everything typically personal, business and organization (Indowebiste, Nd). [9]

### C. APIS

The APIS integrates a variety of features that include functions, contracts, and different gears that allow developers to build programs. The reason for taking help of the APIS is to faster the

process of making the web-system by different capabilities. Devs do not have to build the same functions. The use of an APIs can make a lot of sense if a popular feature can be too complex, in a way that consumes time to build same.

A web System provider is a software program created to integrate a gadget into a community or a provider that gives communication and voice exchange not same systems (interactions). Webpages content stores information on XML fashions so this can result in the sharing of conversations between active structures, connectors, and systems. And within the system, network services now do not require a GUI (Graphical user interface) because web hosting works with logical skills and request information. So, a net service is a way that combines between 2 machines or 2 special programs for public speaking. Fig 3 and Fig 4 are shown the GUI user view and humidity level view.

### III. REASEARH\_METHODS

The things which is required in this study with the help of the Waterfall life cycle version of SDLC software as shown in Fig 2. The scope of this version ranges from the system phase, gadget design and so on to the gadget repair phase. The water cycle cycle can be seen in the third image[19-23].

#### A. Flow explanation

Testing is required to determine gadget requirements, from configuration data to be managed using the system requirements for APIs in an effort to grow into real bridges across multiple gadgets. System Design.

At this stage, device design plans are completed according to the gadget requirements determined at the device analysis level. Device for web design and APIs. The web will get information on hydroponic plants, while the obtained records can be visible on the web and stored on a website as information[24-29].

#### B. Program Coding

In the coding phase, in particular the development of the Internet and APIS use of programming language is primarily based on device-generated architecture.

#### C. System Trial

At the gadget experiment level, a test is performed that the created web can detect, purchase and display facts obtained from hydroponic plants efficiently. Similarly, a test is performed similarly

1) Implementation: Startup level is the level of placement of the gadget this is made to be ready for use. The system is used systematically, i.e. to retrieve facts from hydroponic gardens and display them on the web and stored on a data server. The device also gives statistics on the device in accordance with the request for records from the android's tool.

2) System Maintenance: Device repair is essential to know that the machine continues to function effectively at the gadget protection level, it is mandatory to active facts get, visualize and given for that purpose.

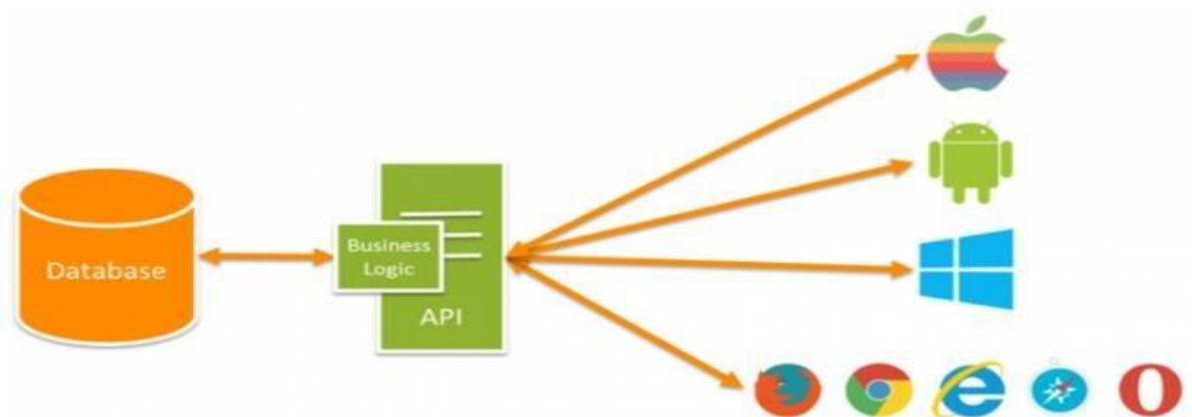


Fig. 1. APIs architecture

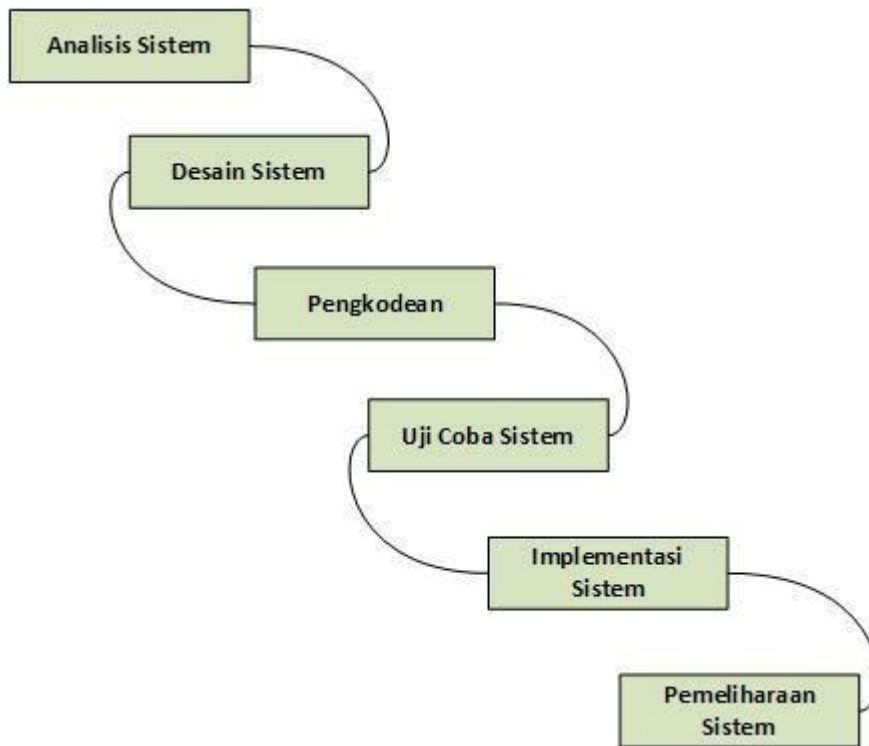


Fig. 2. Waterfall model



Fig. 3. User View

#### IV. RESULTS

User used the APIs to get info on hydro-ponics as evidenced in figure 5.

Some customers have 4 different methods of statistics, named as information of temp., humidity level, pH\_values and water vitamins. the given FIGURE-6 is an online page of the temperature view of hydro-ponic

Humadity\_View PH\_Value View TDS\_VIEW

Types of info obtained, named as temperature information, humidity Value, pH\_values and water content, it may be visualized on the web-

site. Further, APIS-enabled properties can also give statistics on Android gadgets as shown in Fig 7 and Fig 8.

#### V. CONCLUSION

After Final Discussion "Designing net and APIs (application Programming Interface) smart Farming packages" The APIs within a intelligent farming app can access, store and display hydro-panic crop information and give that records on android tool.



Fig. 4. Temperature view



Fig. 5. Humidity\_level\_view



Fig. 6. H\_values

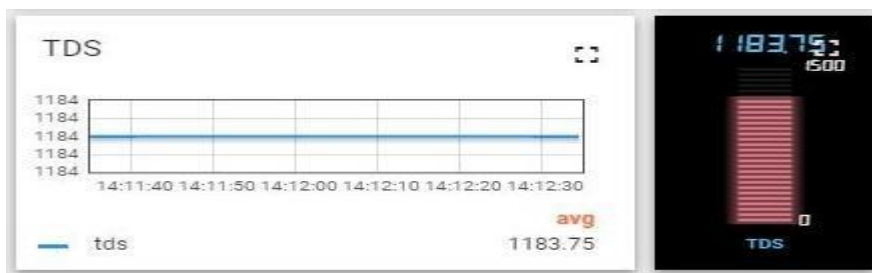


Fig. 7. TDS pic

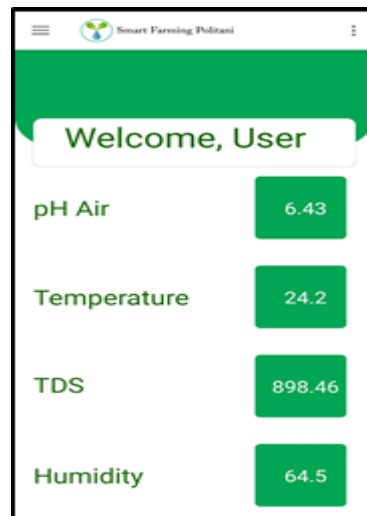


Fig. 8. Display view of Data on Android Devices

#### REFERENCES

- [1] M. Kumar, P. Mukherjee, K. Verma, S. Verma and D. B. Rawat, "Improved Deep Convolutional Neural Network Based Malicious Node Detection and Energy-Efficient Data Transmission in Wireless Sensor Networks," in *IEEE Transactions on Network Science and Engineering*, vol. 9, no. 5, pp. 3272-3281, 1 Sept.-Oct. 2022, doi: 10.1109/TNSE.2021.3098011.
- [2] Sahil Verma, Sonu Mittal, "Implementation and Comparative Analysis of Speed and Distance Beaconing Schemes for VANET", in *International Journal of Computer Science and Information Security (IJCSIS)*, Vol. 14, No. 12, December 2016, (pp. 362-370).
- [3] Sahil Verma et al., "Ideas on collision detection in vehicles using WSN" *International Journal of Recent Research Aspects*, Vol. 3, Issue 3, September 2016, pp. 33-37.
- [4] Kavita, Sandip Kumar Goyal, Sahil Verma, "A Fault Tolerant Approach For Load Balancing In Grid Environment" in *International Journal of Engineering Research & Technology*, Vol. 1 Issue 9, November- 2012, pp. 1-6.
- [5] E. Daniel, "Provision of electronic banking in the UK and the Republic of Ireland," *International Journal of Bank Marketing*, vol. 17, no. 2, pp. 72-82, 1999.
- [6] R. Devellis, "Scale development: theory and applications (2ed)," vol. 26. Sage Publications, 2003.
- [7] I. A. Shah, Q. Sial, N. Z. Jhanjhi, and L. Gaur, "The Role of the IoT and Digital Twin in the Healthcare Digitalization Process: IoT and Digital Twin in the Healthcare Digitalization Process," *Digital Twins and Healthcare: Trends, Techniques, and Challenges*, pp. 20-34, 2023.
- [8] N. Z. Jhanjhi, S. N. Brohi, N. A. Malik, and M. Humayun, "Proposing a hybrid rpl protocol for rank and wormhole attack mitigation using machine learning," 2020 2nd International Conference on Computer and Information Sciences (ICCIS), pp. 1-6, 2020.
- [9] K. Hussain, S. J. Hussain, N. Jhanjhi, and M. Humayun, "SYN Flood Attack Detection based on Bayes Estimator (SFADBE) For MANET," in 2019 International Conference on Computer and Information Sciences (ICCIS), 2019, pp. 1-4.
- [10] I. A. Shah, Q. Sial, N. Z. Jhanjhi, and L. Gaur, "Use Cases for Digital Twin," *Digital Twins and Healthcare: Trends, Techniques, and Challenges*, pp. 102-118, 2023.
- [11] R. Gupta, "A Comparative Analysis of Trust Based Applications in Wireless Sensor Networks," *International Journal of Engineering & Technology*, vol. 7, no. 4, pp. 73-77, 2018.
- [12] R. Shanker, "Analysis of information security service for internet application," *International Journal of Engineering & Technology*, vol. 7, no. 4, pp. 58-62, 2018.
- [13] Kavita, "Implementation and performance evaluation of AODV-PSO with AODV-ACO," *International Journal of Engineering & Technology*, vol. 7, no. 2, pp. 23-25, 2018.
- [14] R. Agarwal, and A. G. Thomas, "Performance comparison of deep cnn models for detecting driver's distraction," *Materials & Continua*, vol. 68, no. 3, pp. 4109-4124, 2021.

- [15] A. Almusaylim, Z. Jhanjhi, N. Z. Alhumam, and A, "Detection and mitigation of RPL rank and version number attacks in the internet of things: SRPL-RP," *Sensors*, vol. 20, no. 21, pp. 5997–5997, 2020.
- [16] P. Rani, "Robust and Secure Data Transmission Using Artificial Intelligence Techniques in Ad-Hoc Networks," *Sensors*, vol. 22, no. 1, pp. 251–251, 2022.
- [17] Hui Li, Hailing Zhang, Dan Liao, Xiaojie Zhu, Yueyue Dai, and Sahil Verma. 2022. A data sharing method for internet of drones based on federated learning. In *Proceedings of the 5th International ACM Mobicom Workshop on Drone Assisted Wireless Communications for 5G and Beyond (DroneCom '22)*. Association for Computing Machinery, New York, NY, USA, 91–96. <https://doi.org/10.1145/3555661.3560870>
- [18] Mudit, K. Divya, S. K. Joshi and S. Verma, "Facial Expression Detection using Convolutional Neural Network," 2022 International Conference on Cyber Resilience (ICCR), Dubai, United Arab Emirates, 2022, pp. 1-5, doi: 10.1109/ICCR56254.2022.9995993.
- [19] L. Singh, S. Khare, A. Parvez and S. Verma, "Research Paper on Path-finding Algorithm Visualizer," 2022 International Conference on Cyber Resilience (ICCR), Dubai, United Arab Emirates, 2022, pp. 1-4, doi: 10.1109/ICCR56254.2022.9995925.
- [20] Zhihan Lv, Liang Qiao, Sahil Verma, and Kavita. 2021. AI-enabled IoT-Edge Data Analytics for Connected Living. *ACM Trans. Internet Technol.* 21, 4, Article 104 (November 2021), 20 pages. <https://doi.org/10.1145/3421510>
- [21] P. Rani, Kavita, S. Verma and G. N. Nguyen, "Mitigation of Black Hole and Gray Hole Attack Using Swarm Inspired Algorithm With Artificial Neural Network," in *IEEE Access*, vol. 8, pp. 121755-121764, 2020, doi: 10.1109/ACCESS.2020.3004692.
- [22] Ibrahim El-Henawy, Marwa Abo-Elazm, Handling within-word and cross-word pronunciation variation for Arabic speech recognition (knowledge-based approach), *Journal of Intelligent Systems and Internet of Things*, Vol. 1, No. 2, (2020) : 72-79 (Doi : <https://doi.org/10.54216/JISIoT.010202>)
- [23] Disheng Zheng, Kai Liang, Chaotic Butterfly Optimization with Optimal Multi-key Image Encryption Technique for Wireless Sensor Networks, *Journal of Intelligent Systems and Internet of Things*, Vol. 1, No. 2, (2020) : 80-92 (Doi : <https://doi.org/10.54216/JISIoT.010203>)
- [24] Safaa Saber, Ibrahim Elhenawy, A Survey on Flower pollination algorithm, *Journal of Intelligent Systems and Internet of Things*, Vol. 2, No. 1, (2021) : 05-11 (Doi : <https://doi.org/10.54216/JISIoT.020101>)
- [25] Abdel Nasser H. Zaied, Shaimaa Mohamed, ERP Implementation Road Map for Small and Medium Size Enterprises (SMEs), *Journal of Intelligent Systems and Internet of Things*, Vol. 2, No. 1, (2020) : 14-25 (Doi : <https://doi.org/10.54216/JISIoT.020102>)
- [26] Jabbar Abed Eleiwy, Characterizing wavelet coefficients with decomposition for medical images, *Journal of Intelligent Systems and Internet of Things*, Vol. 2, No. 1, (2021) : 26-32 (Doi : <https://doi.org/10.54216/JISIoT.020103>)
- [27] Fatemeh Safara, Autism Spectrum Diagnosis using Adaptive Learning Algorithm for Multiple MLP Classifier, *Journal of Intelligent Systems and Internet of Things*, Vol. 2, No. 2, (2021) : 33-44 (Doi : <https://doi.org/10.54216/JISIoT.020201>)
- [28] Sennan, S., Somula, R., Luhach, A. K., Deverajan, G. G., Alnumay, W., Jhanjhi, N. Z., ... & Sharma, P. (2021). Energy efficient optimal parent selection based routing protocol for Internet of Things using firefly optimization algorithm. *Transactions on Emerging Telecommunications Technologies*, 32(8), e4171.
- [29] Adeyemo, V. E., Abdullah, A., Jhanjhi, N. Z., Supramaniam, M., & Balogun, A. O. (2019). Ensemble and deep-learning methods for two-class and multi-attack anomaly intrusion detection: an empirical study. *International Journal of Advanced Computer Science and Applications*, 10(9).